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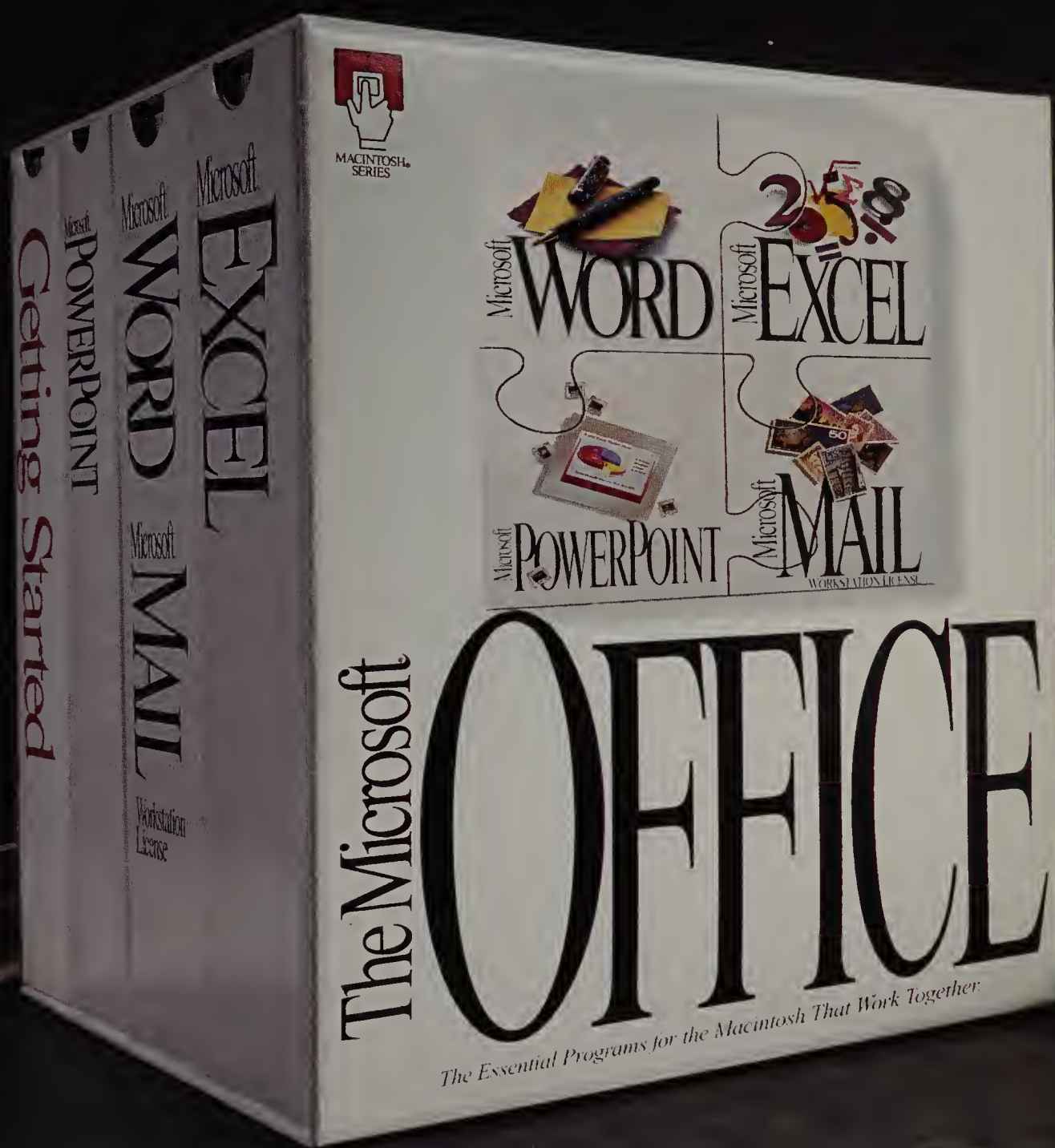

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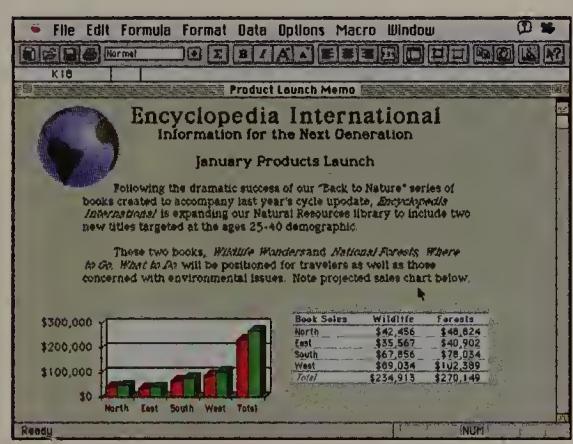

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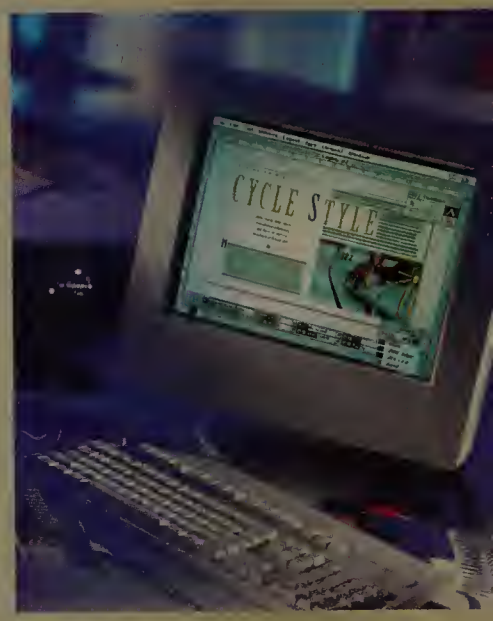

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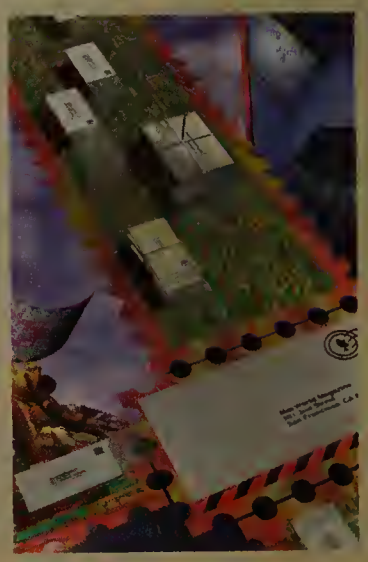

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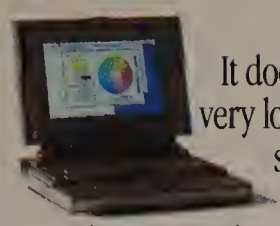

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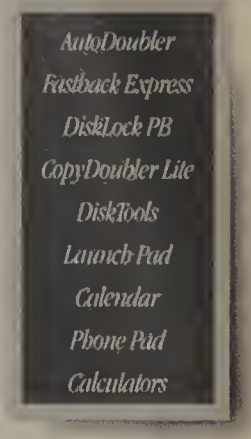

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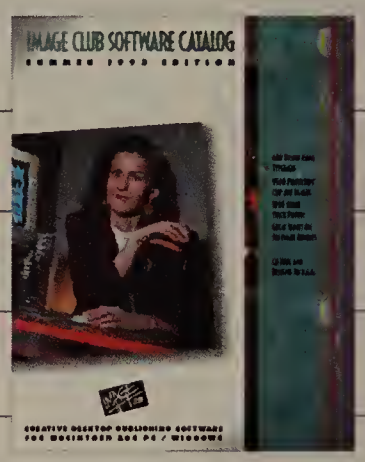

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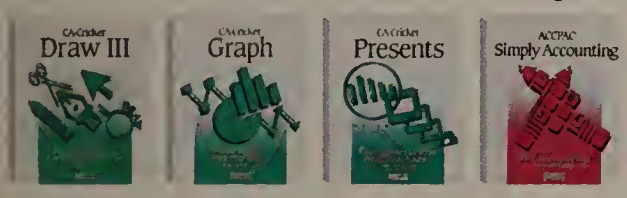

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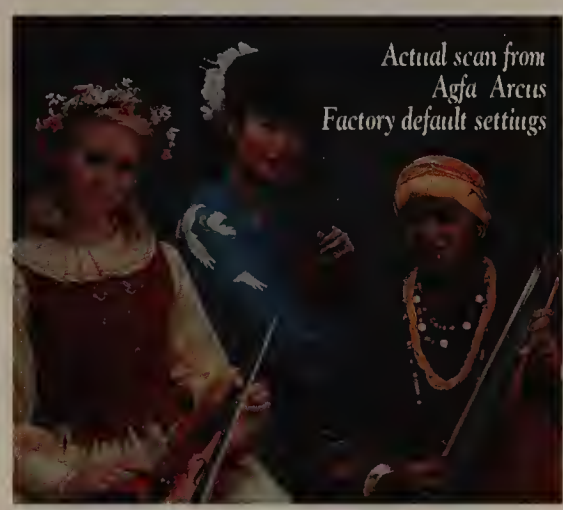

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BY ADRIAN MELLO

Should Apple License the Mac Operating System?

What the Mac really needs is to be special again

THE MAJORITY OF INDUSTRY observers agree that to ensure long-term survival, Apple must increase its market share. And when speaking of this, most people refer to the Macintosh Operating System, not necessarily Apple-branded hardware. From this viewpoint, Apple's key competitor is Microsoft, since Microsoft provides the lion's share of system software for desktop computers. There are more than ten times as many DOS PC users as Macintosh users, and the number of people using the DOS/Windows combination is nearly three times the number of Macintosh users. In many circles, Microsoft is viewed as an invincible force that will eventually crush Apple's system software business (of course, it wasn't long ago that IBM was regarded with the same kind of awe).

The competition between Microsoft and Apple takes on mythic proportions—a David versus Goliath, Part Two—in the minds of Apple enthusiasts or those who fear Microsoft hegemony. In reality, Microsoft has bigger fish to fry, and Apple doesn't need to vanquish Microsoft to have a healthy business. All Apple has to do is make sure the Mac OS continues to be perceived as a viable alternative to Windows. Now that we've gotten realistic about Apple's challenge, we can take an objective look at the competitive environment.

Apple's Challenges

Windows provides most of Microsoft's new growth in operating systems and as such presents the most serious challenge to the growth of the Mac OS. Furthermore, Windows is viewed as the natural upgrade path from DOS. This gives Windows a lot of leverage in growing its market share. Apple's challenge is to demonstrate that it can approach or exceed the growth pace of Windows. To do that, if Windows grows by 10 million units the Mac OS needs to grow somewhere in the vicinity of 3 or 4 million units.

Common wisdom has it that if Apple hopes to adequately grow its market share it must license and/or port the Macintosh Operating System. The licensing strategy has been a key point in the decade-long debate about market share and the Mac's survivability. It's virtually certain that Apple's management devotes intense attention to its competitive position, so if licensing is such an obvious choice, why haven't they done it?

Apple has two major licensing options. It could license the Mac OS to other hardware vendors who would produce Apple-sanctioned clones. Apple could also port the Mac OS to Intel-based PCs.

But it's important to recognize that Apple enjoys important advantages by being the lone vendor of both hardware and system software for the Macintosh. As new Mac models appear, Apple can integrate new technology and overcome potential compatibility problems more easily than if it had to take multiple systems vendors into account. Because Apple is the sole provider of the Mac, the company has full control of the structure, pricing, and distribution channels within its own market. This gives Apple a lot of power to control its own destiny.

The benefits of any licensing arrangement must outweigh the advantages Apple enjoys by being the sole vendor. Perhaps the main reason Apple hasn't licensed its operating system is that its revenues are based on hardware sales, not software sales. The company probably can't afford an abrupt drop in hardware sales while people buy products with licensed versions of the Mac OS.

Licensing Mac Clones

For years, the Mac market has prayed for Mac clones the way drought victims pray for rain. At one time, clones would probably have provided huge growth to the market share of the Mac OS. It's not at all clear that this would still be true today. If Apple were to license clones, would the clones result in incremental sales or simply cannibalize Apple's existing market? Even if clones increased the size of the market, would the licensing profits offset profits Apple would have earned by selling the hardware itself? Now that Apple has seriously reduced the price of Macs, clones would no longer have a huge price advantage. Given the strength of, and loyalty customers have for, the Apple brand, users would be unlikely to buy clones that didn't offer a significant price advantage or some other distinction. As in the DOS PC market, clones might succeed by offering a different balance between price and support or by satisfying the needs of vertical markets. Apple has already demonstrated a willingness to conservatively pursue the latter option.

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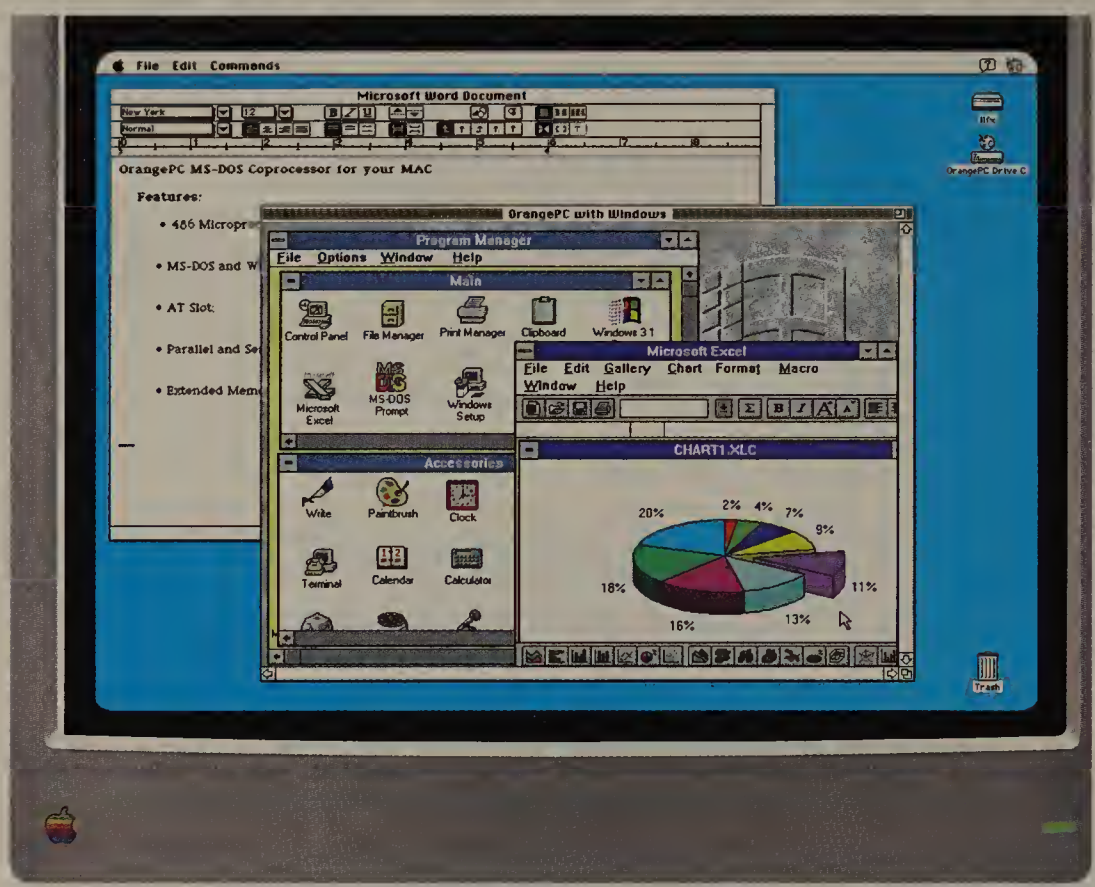
Of course, all of this assumes that the appropriate hardware makers would jump at the chance to produce and sell Mac clones. My guess is that Apple has already tested the waters by quietly approaching some key computer makers and has failed to generate enough interest because it can't offer a deal that both parties find worth the risk.

Here's a hypothetical case to help understand why it might be difficult for Apple to forge an alliance with clone makers. Let's say that Dell decides to license the Mac Operating System. It produces a Mac clone that turns out to be a phenomenal success. But a significant percentage of its sales appear to come at the expense of Mac sales. Apple doesn't like this, and on the next revision of the Mac OS, Apple is not quite as supportive of Dell. This puts Dell several months behind in development and makes its customers unhappy.

Authorized clone makers would both compete directly with Apple and depend on Apple for the technology with which to compete. By comparison, as formidable as Microsoft may be, it doesn't compete with its hardware customers. For a clone licensing approach to succeed, Apple would have to work out some sort of complementary strategy with the clone makers so that they would not be going after the same markets. At present, Apple seems to want it all. It has targeted Macintosh models for business, consumer, and education channels. This doesn't mean that clones couldn't happen or that this licensing strategy couldn't work. It just means that it is not as easy as it appears at first glance.



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Running on Intel Processors

One of the most exciting possibilities would be for Apple to design a version of the Mac Operating System that could run on Intel-based PCs. This strategy could dramatically increase Apple's installed base. However, DOS and Windows users are no more likely to buy a Mac on a 486 than they are on a 68040. These users buy on the basis of price and applications compatibility. Corporate users have historically chosen Windows because it represents a growth path that lets them maintain their existing standard: DOS. Now that Windows itself is a growing standard, it is unlikely that companies that have adopted it will immediately change course, especially if they are offered an either/or choice. For these reasons, a Mac OS running on Intel-based PCs would have to run Macintosh, DOS, and Windows applications—a sizable technical challenge.

Assuming that Apple could overcome the technical challenges, it would still have to consider whether the payoff of such a project was worth the vast resources it would have to commit. Apple's potential market would not include all Intel-based PCs. Due to its graphical interface, the Mac OS would be unlikely to run in any usable way on anything other than 486 and Pentium machines. After all, this is pretty much true for Windows as well. Beyond this, if Intel software sales seriously eroded Mac hardware sales, would Apple be ready to convert its business to selling system software? Think of it this way: Apple would have to sell 10 to 20 copies of the Mac OS for use on Intel-based PCs to make up the revenues from selling one midrange Macintosh. How likely is that?

If Apple decided the payoff was big enough, it would have to convince customers that it was adding enough value to make the conversion from Windows to Mac worthwhile. People are naturally

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conservative and rarely make any change without a compelling reason. I doubt that many DOS and Windows users would upgrade to the Mac OS—simply because they would see no need to. After all, most Windows users don't even know they have a problem! Most of them regard the Windows interface as a big improvement over DOS and don't detect a significant difference between the Mac and Windows interface. On the other side of the desktop world, one GUI (graphical user interface) is as good as another. In any case, Apple's window of opportunity is rapidly closing because the next version of Windows is likely to look a lot more like the Mac, now that Microsoft has won its lawsuit with Apple over the interface-similarity issue.

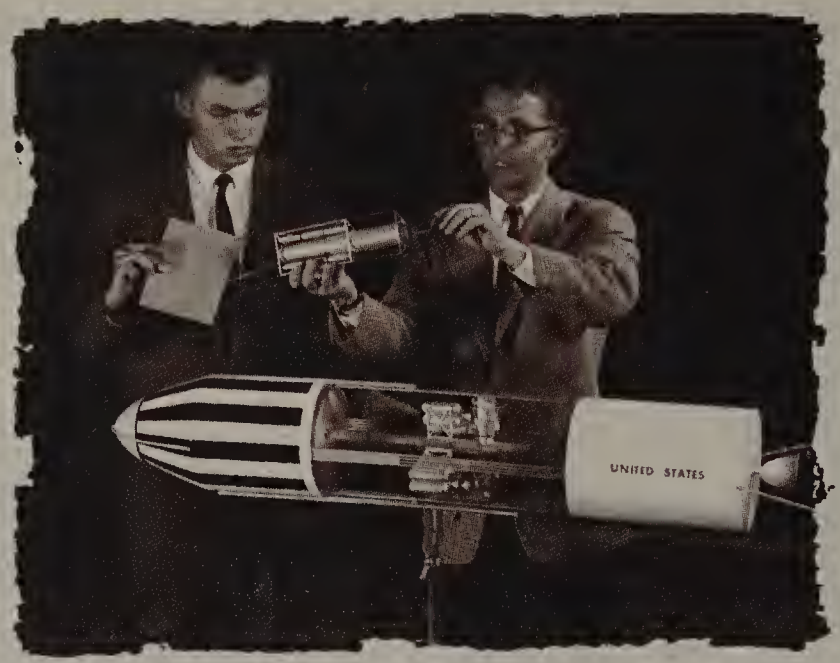
The Importance of Compelling Benefits

I haven't yet touched on the most important issue of all, which lies at the core of the Mac's survival. The Mac has always sold well because, beyond its interface, it offered compelling applications that were largely unavailable on other personal computers. This is not so true anymore. Windows users have few complaints with their applications, since most major Mac applications are now available on Windows. And this is actually the greater cause of concern, because it reflects on the Mac's viability as a whole—whether we're talking about licensing a version of the Macintosh OS or packaging it with Apple's hardware.

Applications like desktop publishing have always been part of the Mac's unique selling proposition. If Apple hopes to keep the Mac alive by offering an alternative to Windows, Apple must encourage distinguishing and compelling Mac applications. It is crucial that Apple convince its developers to create truly remarkable applications that can be delivered only on the Mac. The best way to do this is to field ground-breaking technology that offers developers exciting and unique opportunities. To Apple's credit, it has done this with the AV Macs, which provide important new architectures for telephony and video. Apple should push hard in this direction and support other new technologies that promise both a near-term and long-term payoff, rather than worry too much about clones or porting the OS to 486 systems.

Although it's safe to assume that Apple has investigated licensing scenarios and found that they aren't worth the risk, this is not to say that some kind of licensing strategy doesn't make sense. Apple should probably skip the Intel option but go ahead and work out a noncompetitive licensing arrangement with hardware vendors who want to solve problems in markets that Apple doesn't understand or shouldn't risk resources on (such as workgroup servers). The adoption of the PowerPC CPU should create an environment that permits both the Mac OS and Windows to run on the same hardware platform. In fact, Insignia Solutions has already announced that it is developing software that enables Windows programs to run on PowerPC-based Macintoshes.

If Apple combined a limited licensing strategy with offering price-competitive Macs, it could probably reduce risk and maximize the gain of its available resources. This strategy along with good products should permit Apple to keep pace or gain market share for the Mac. But its first priority should be to maintain the Mac's identity as an alternative that offers important applications you just can't find on Windows. m



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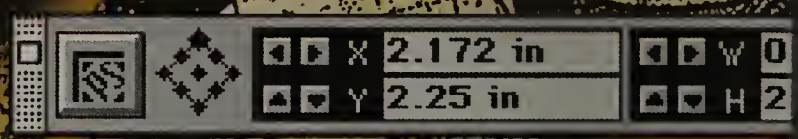

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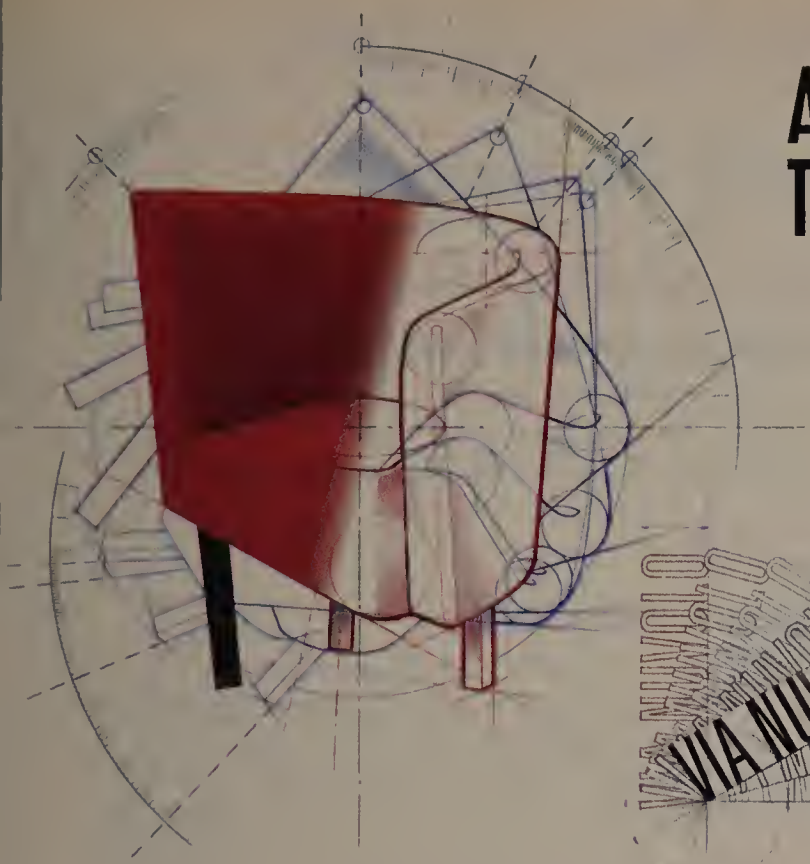
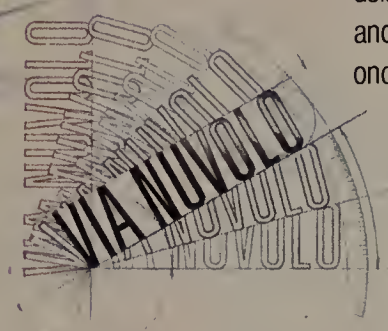


NEW: Incremental rotation of text and graphics.
It's easy to rotate in 0.01-degree increments—either visually, using the rotation tool or numerically, using the Control palette (where you can also skew and mirror elements). You can even edit text directly once it's been rotated.



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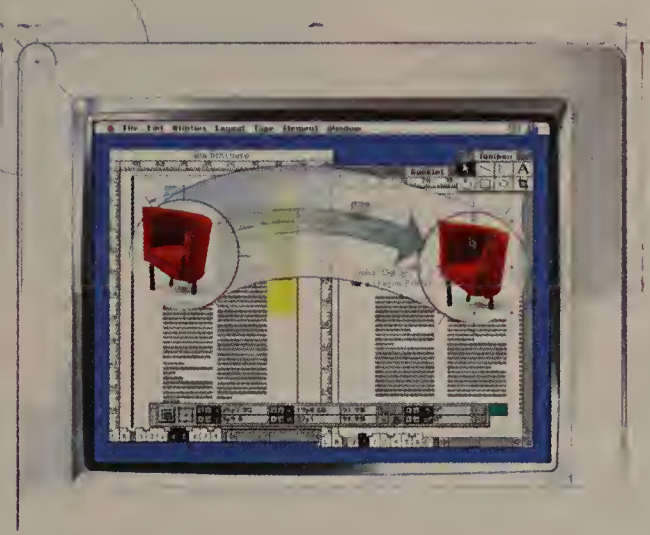

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MicroNet offers a variety of high performance data storage compatible with the new 40 MHz Quadra 840av and the Centris 660av computers. Products include internal and external Hard Disk Drives up to 2780 MB, Rewritable Optical systems from 128 MB to 1186 MB, multi-session Photo CD-ROM drives, DAT Backup systems up to 16 GB, and our Raven·800 Disk Arrays specifically designed for the I/O requirements of audio-visual applications.

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Raven·800 Upgrade Kits:		Suggested Retail
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Q8RUi-2024R - 2024 MB	Internal Quadra 800 upgrade kit includes one 1000 MB drive, data and power cables, Raven Software utility, and a MicroNet NuPORT-III SCSI card. Improves data transfer rate from 2.2 MB/sec to 6.2 MB/sec.	2,095
Raven·040 Upgrade Kits:		
Q9RUi-1030R - 1030 MB	Internal Quadra 950 upgrade kit includes one 500 MB drive, data and power cables, and our Raven Software. Improves data transfer rate from 2.2 MB/sec to 5.6 MB/sec. Leaves all five NuBus slots open.	$ 1,395
Q9RUi-2024R - 2024 MB	Internal Quadra 950 upgrade kit includes one 1000 MB drive, data and power cables, and our Raven Software. Improves data transfer rate from 2.2 MB/sec to 6.2 MB/sec. Leaves all five NuBus slots open.	1,795

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Letters

Real-Time Readers

AS A SATISFIED OWNER OF AUTO-Doubler, I feel I should point out a serious flaw in Matthew Leeds' article, "Real-Time Compression" (August 1993). Mr. Leeds makes an assumption that too many *Macworld* writers have made in the past—that time and money are of equal value to all. Many Mac users (myself included) are willing to tolerate slightly slower performance to gain 50 percent more hard drive space cheaply.

Here's a quick lesson in the real-world economics of real-time compression. I bought AutoDoubler a little over a year ago, and that purchase (less than $50) enabled my Mac IIsi to function satisfactorily with its paltry 80MB drive. Since then, the price of an external 240MB Quantum drive has fallen from about $800 to about $400, and I can now afford to buy one. As Mr. Leeds says, a few hundred dollars is nothing to sneeze at.

Lawrence Barden
Oakland, California

I WAS SURPRISED THAT YOU PANNED Fifth Generation Systems' technical support in your August compression article. My experience, though not by telephone, has been quite pleasant. I left queries and comments about Pyro on the company's board on America Online and received friendly, helpful, personal E-mail sent within 24 hours.

Alex Forbes
San Mateo, California

M'aidez, 800/SOS-APPL

MS. BRANSCUM'S STORY ABOUT the Quadra 800 owner who moved his system files around (they don't move themselves) and then screamed when a local dealer charged him to clean up the mess leaves me full of dread (*Conspicuous Consumer*, August 1993).

Servicing dealers are not owned by Apple Computer—they are compensated by Apple for performing individual warranty repairs. Apple does not guarantee the integrity of the System Folder, and any damage customers do to those files is their responsibility. Images of all the disks that the dealer used to repair the gentleman's Quadra were on the CD that came with the machine, and the owner's manual is precise about doing what the local dealer did. It simply takes time to do it, and in business, time costs money. There is little profit in selling hardware—it's skill with customer solutions and being there when needed that keep a local dealer afloat. Free and total support for anyone else's customer is not a good business practice in any industry, and it is suicide when computers are involved.

After receiving angry calls from *Macworld*-reading customers who wanted their money back for everything from virus elimination to data recovery and fire-damage repairs, I checked with Apple by calling the same number the aforementioned gentleman did. I was told that, while it could be possible that an "overzealous new hire" may have gotten carried away and harried the dealer into giving the customer's money back, it is not Apple's policy to provide free software troubleshooting, except via phone support.

As dealers' profit margins narrow even further, let's hope that there are some still around when consumers are encouraged to turn there for free maintenance.

Bruce Chilson
Executron Computers
Santa Rosa, California

TWO DAYS AFTER I PURCHASED A LaserWriter 600, I realized that I could not print the second side of a page—toner smudged the top inch of the sheet. My dealer (with whom I have been working for seven years) said that there was nothing they could do and that I must call Apple.

That was the beginning of a two-week nightmare. First, the rocket scientist at 800/SOS-APPL told me that the printer didn't support double-sided printing. When I pointed out that the feature was outlined in the manual, he said he'd check and call me back, which he did—two days later. He then dispatched a field engineer to fix the problem (another two-day delay). The engineer replaced some parts, but the printer still didn't work. At that point, I could either wait another two days or more while he obtained new parts and kept trying, or I could return the printer. I chose the latter.

I paid $2500 for a printer that didn't work from day one. The dealer should have replaced it immediately, but instead I had to deal with people at Apple who were unfamiliar with their own equipment, uncooperative, and even rude. I found myself shouting and using bad language to get anywhere with those people. Yes, the dealer made some price and service concessions after I screamed from Cupertino to Dallas to Buffalo, but I'm still out the lost time and work, and the

continues

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CORRECTIONS

- *In the sidebar "Comparing the LC 520's Performance" ("The Macintosh LC 520," September 1993), the longest bars in the System Performance graphs should have been colored red to indicate the best result in each test.*
- *In cataloging the hardware features of the AV Macs ("The AV Macs," October 1993), we stated that the Quadra 840AV has a PDS slot. The Quadra 840AV has three NuBus slots, but no PDS slot.*
- *In "Planning to Negotiate"* (At Work *news, October 1993) Negotiator Pro architect Daniel Burnstein was misidentified as a Harvard law professor. Burnstein is former director of the Harvard Law School Videodisc Program and former associate of the Program On Negotiation. Also, the price of the Negotiator Pro add-on for purchasing negotiations has been raised to $495.*

mental cruelty of having to become a harpy in order to be treated fairly. If I treated my clients the way Apple and the dealer treated me, I'd have no business.

Linda K. Danahy
Gowanda, New York

A Few of My Favorite Things

I COUNT MACS AND BMW AUTOMOBILES among the good things in life. Hence I read with interest Adrian Mello's "Name That Macintosh" in the August 1993 issue (*State of the Mac*). He rightly bemoans Apple's anarchic, confusing, and self-subverting approach to naming products. But he's wrong to cite the methodology of BMW model designation as an example of similar arbitrariness and mystification. Indeed, in his search for a meaningful system, Mello need look no further than the nomenclature of BMW.

Steven Dworetz
Brookline, Massachusetts

Macworld received several treatises on the naming customs of German automobile manufacturers, speculative theses on the origins of Mac names (many readers think Apple missed a bet when it chose SE/30 over SEx), and the following exposé of code names used by Apple over the years.—Ed.

IN REFERENCE TO ADRIAN MELLO'S column on Macintosh names, here are a few of the names that Apple's development engineers have called their gizmos while they worked on them.

Macintosh SE:
PlusPlus, Maui, Chablis
Macintosh SE/30:
Green Jade
Macintosh Classic:
X.O.
Macintosh Classic II:
Montana, Apollo
Macintosh LC:
Elsie
Macintosh LC II:
Foster Farms
Macintosh II:
Milwaukee, Reno, Paris, Cabernet
Macintosh IIx:
Spock
Macintosh IIsi:
Erickson, Raffica, Raffika
Macintosh IIcx:
Aurora I
Macintosh IIci:
Aurora II, Pacific
Macintosh IIfx:
F-16, Blackbird, Stealth, Zone 5
Macintosh Portable:
Esprit, Malibu, Laguna
Portable w/ backlight:
Aruba
PowerBook 100:
Asahi, Derringer, Rosebud
PowerBook 140:
TIM LC, TIM Lite
PowerBook 170:
TIM
Quadra 700:
Shadow, Spike, IIce
Quadra 900:
Darwin, Eclipse, IIex
System 7:
Big Bang, M80, Pleiades
Macintosh Plus keyboard:
Nimitz
Apple Extended Keyboard:
Saratoga

Brian Kendig
via Internet

Macworld Censor Censured

I WAS DISAPPOINTED AND ANNOYED to see that you had defaced the provocative advertisement from Global Village Communication in your August issue. There was nothing offensive or improper about the uncensored original; on the contrary, it was a handsome and intriguing piece of artwork. Your "censored" sticker is what makes it all seem naughty.

Brian Hayes
Durham, North Carolina

I WAS QUITE OFFENDED BY GLOBAL Village Communication's two-page spread in your September 1993 issue.

I note that Global Village garnered one of your seventh annual World-Class

continues

Thunder™ II is the only 24-bit graphics solution that combines three breakthrough technologies for explosive performance: the highest resolution, the fastest image processing, and the industry's fastest QuickDraw™ acceleration — all on a single card.

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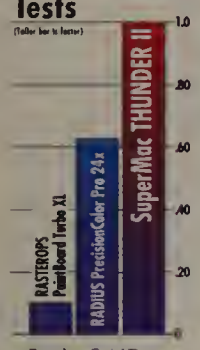
1152 x 870 Performance Tests



Based on QuickDraw Acceleration using Hydra Benchmark v2.1, Macworld 25. Test results normalized to the fastest card performance.

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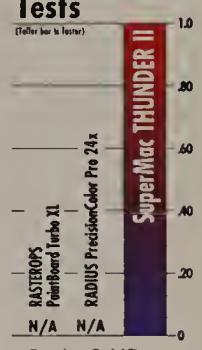

Based on QuickDraw Acceleration using Hydra Benchmark v2.1, Macworld 25. Test results normalized to the fastest card performance.

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Circle 88 on reader service card

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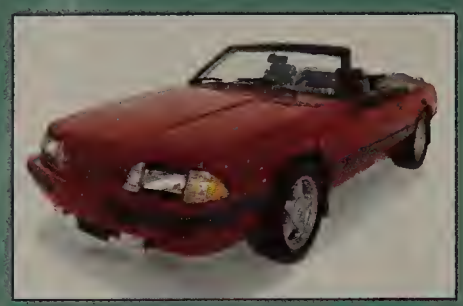

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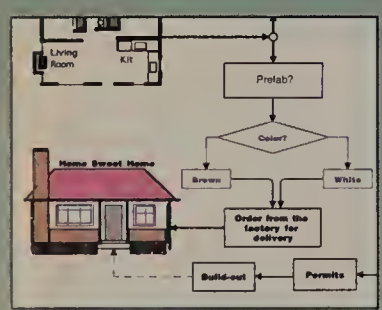

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Awards for its products. It's strange, then, that the company would employ such a disgusting illustration and headline to promote its products. The products may be world-class; the advertisement is trash.

It is unfortunate that a fine magazine such as *Macworld* would accept the advertisement for publication. I am sure I am not the only reader who was offended. If the advertisement was intended for publication in *Hustler* magazine and appeared in *Macworld* by mistake, then I apologize.

Charles Downs
Phoenix, Arizona

IN KEEPING WITH THE TREND started by your censorship of the wonderfully innovative Global Village advertisement in your most recent issue and appeasement of (to use the appropriate, politically correct terminology) "the graphically challenged," I request that you also censor PLI's pro-automobile ad on page 261, for promoting smog-producing cars instead of environmentally friendly bicycles; Apple's sexist and racist PowerBook ad on pages 172 and 173, for failing to recognize that Corporate America is not always white and male; and Data Desk's ad on page 46 for stereotyping wolves as evil. Of course, you may also want to censor this letter for being offensive to the sarcastically challenged.

J. W. Akers-Sassaman
via CompuServe

Finder: More Than Meets the Eye

TO DAVID POGUE, IN REFERENCE TO his recent column "Iconomics 101" (*The Desktop Critic*, July 1993)—you're usually more perspicacious than this, so I was surprised when you claimed that "icons are the only way the Mac's interface is graphic." What about the menu bar? What about a zoom effect as windows open or close? What about the graphical metaphor of a window? What about cursors that change shape and control-panel sliders and tool bars and rulers and floating palettes? It must have been a long time since your last experience in command-line hell, and your memory has weakened with your advanced age, so you're taking all this for granted.

Lee Smith
Toronto, Canada

Give CD-I Credit

IN THE "PHOTO CD: A SHOPPING LIST" sidebar in the "Hands-On: Photo CD" article (July 1993), you list consumers' options for Photo CD playback mechanisms. You mention 3DO, but you neglect the relatively mature CD-I technology developed by Philips. Philips was instrumental in developing Photo CD technology with Kodak, and the PCD Writer that records Photo CDs was developed by Philips. Philips CD-I players are multisession and also support CD-I, CD-DA, CD-XA, and CD+G.

Chris Severton
Senior Engineer, OptImage
West Des Moines, Iowa

High-Tech Upgrade

IN YOUR REVIEW OF THE CENTRISes (*Reviews*, June 1993), you mention bringing the clock of the 610 up to 25MHz by changing the crystal and adding a heat sink to the processor chip. Could you tell me where I might obtain these items?

Michael Zak
West Seneca, New York

Clock crystals and heat sinks are generally available from large electronics-supply stores—check your local yellow pages under Electronics or Electronics Suppliers. Readers should note that upgrading your Mac in this fashion voids the warranty, and you could toast your motherboard during installation.

Macworld is currently looking at several kits for Centrises, LC III's, Quadras, and the IIsi that various companies are considering marketing. Our preliminary assessment is that they do the job with minimal limitations (such as disallowing the use of certain extrawide NuBus boards).—Ed.

Sex . . . (Yawn)

I WAS AMUSED TO SEE THE PLETHORA of letters you got concerning Steven Levy's column on pornography (*Letters*, August 1993). Personally, I'd put pandering to people's sexual peccadilloes way, way down on my list of immoral acts causing the ruination of this industry or this country.

Neil Taylor
Mishawaka, Indiana

Letters should be sent to *Letters, Macworld*, 501 Second St., San Francisco, CA 94107; via fax, 415/442-0766; or electronically to CompuServe (70370,702), MCI Mail (294-8078), America Online (Macworld), or AppleLink (Macworld1), or via Internet (70370.702@compuserve.com). Include return address and daytime phone number. Due to the high volume of mail received, we can't respond personally to each letter. We reserve the right to edit all letters. All published letters become the property of *Macworld*. m

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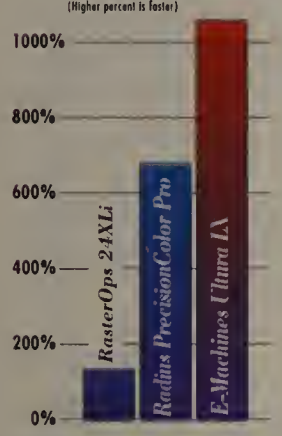

Performance percentage based on Potrero Color Publishing Benchmark 2.0 running on a Macintosh Quadra™ 950.

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Circle 136 on reader service card

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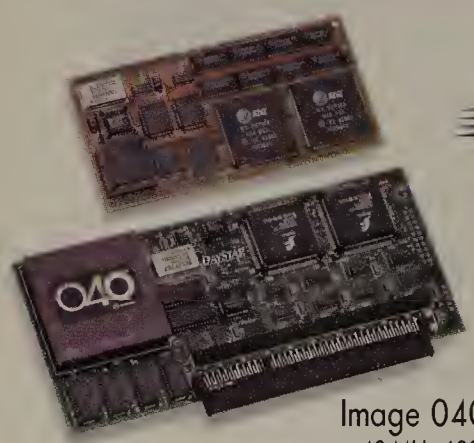

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Circle 7 on reader service card

LATE-BREAKING NEWS

MacBulletin

Apple Splits System Software Apple's System 7 Pro (one user $149, ten users $999), expected to debut in mid-September, includes two system extensions previously sold separately: AppleScript, which lets you customize your Mac environment through scripts, and QuickTime 1.6, for playing digital videos. System 7 Pro also comes with the new PowerTalk extensions, which bring Apple Open Collaboration Environment's (AOCE) built-in E-mail and groupware services to the Mac (see "AOCE—Apple's Plan for Groupware," in this issue). System 7 will continue to be developed and sold for home and education users.

Newton's Flaws Prompt Response Newton MessagePad owners report some problems with AC adapters, start-up, and erratic handwriting recognition. Apple has responded with a thank-you letter to purchasers that includes the support number (800/505-2775). "We've heard of a few incidents where the MessagePad does not perform at an optimal level," says the missive."As a result, we will address any issues you may have with your MessagePad as quickly as we can."

Iomega Cuts Bernoulli Prices Iomega has cut prices on its Mac-compatible Bernoulli removable-cartridge drives. The MacInsider 150, a 150MB internal drive, went from $975 to $589. The MacTransportable 150 is now $699, a 28 percent drop. The MacTransportable 90's price fell 17 percent to $589. The company also cut cartridge prices by up to 54 percent. Iomega (801/778-1000) recently increased the warranty on its 3½-inch drives to two years.

IBM Ships Mac Monitors IBM (800/772-2227) is offering two color monitors that do not need a Mac adapter. The $1260 IBM 17P Color Monitor is a 17-inch display with 1280 by 1024 resolution and a refresh rate of 77Hz. The IBM 21P Color Monitor is 21 inches diagonally, has a resolution of 1600 by 1200 at 60Hz, and should list for around $2000, although that price was not firm at press time. Both conform to the EPA's Energy Star energy-saving program and the Swedish MPR-II guidelines for reduced ELF emissions.

CE Sells Software Start-up PrairieSoft has purchased DiskTop, Alarming Events, Amazing Paint, MockPackage Plus Utilities, and In/Out from CE Software. PrairieSoft (515/225-3720) is handling technical support for all the products and is considering whether to update them.

Fast Ethernet Grand Junction (510/487-5985) has announced the FastSwitch 10/100 hub, which will provide twenty-four 10BaseT switched Ethernet ports and two 100-Mbps Ethernet ports for $7250; the 10/100 will be available in the fourth quarter of 1993. FastSwitch 10, scheduled to ship this fall, will offer the same twenty-four 10-Mbps switched ports without the 100-Mbps ports for $6250.

Microsoft versus Justice Department The U.S. Department of Justice has picked up where the Federal Trade Commission left off, initiating its own investigation of Microsoft's trade practices. A Justice Department spokeswoman would not comment except to say that the department was reviewing the FTC documentation to reduce duplication of effort. Microsoft said it will cooperate fully with the inquiry.

Symantec to Buy 5th Generation Another merger will further the great software consolidation of 1993 if Symantec completes its acquisition of utility vendor 5th Generation Systems. In recent years, $225 million Symantec has acquired Peter Norton Computing and its Norton Utilities for Macintosh, Leonard Software and its GreatWorks integrated package, and Contact Software and its ACT contact manager. m

News

EDITED BY TOM MORAN

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Making the Quantum Leap

When Apple ships PowerPC Macs in early 1994, you can expect better performance and competitive prices. But most important, the PowerPC Macs will be Macs. Although they will not use Motorola's 680X0 series of CPUs, the core of every Macintosh ever built, they will run today's Mac software, use the familiar Mac Finder, and run the same Mac System 7.1. The first versions should also support most current-generation Macs' add-on NuBus boards. Small wonder that usually skeptical third-party developers are very enthusiastic.

According to Apple and third-party developers who have seen prototypes of PowerPC-based Macs, here's what you can expect.

DAVID KAHL

Operating System

The first PowerPC Mac will use System 7.1. The visible difference will be a special enabler in the System Folder, as there is now for 68040-based Macs. The real differences will be inside the System: its core toolboxes—components, like QuickDraw, that interact with application programs, like Microsoft Word and Aldus PageMaker—will be rewritten in the native programming language used by the PowerPC chip. In typical business applications as much as 90 percent of the activity on the computer will be executed in the much faster native PowerPC code, Apple says.

The other System 7 components will run in emulation, with their Motorola-specific commands being translated to PowerPC commands through a component in the operating system. (The emulation will support everything available in the 68LC040 CPU used in the Centris 610 and some Centris 650s.) This takes up more processor time than does the toolbox translation described above, but the overall drag on performance is minimized, since only less-frequently-used routines are emulated. The use of emulation, rather than rewriting all the System 7 components, let Apple get the Mac Operating System up and running on PowerPC-based hardware quickly.

Apple says that the first PowerPC Macs will run System 7 and your current applications at the same speed as a

Centris 650 will run them today, and developers confirm these estimates. And if you upgrade your applications to PowerPC-specific versions, they'll just get faster.

Much of the native PowerPC toolbox routines and the emulation system will be in the PowerPC Mac's ROMs, so you won't be able to install a PowerPC Mac's version of System 7 onto a non-Apple PowerPC computer. Apple says it will license the ROMs to developers such as DayStar Digital so they can produce accelerators and other system upgrades.

Applications

Thanks to the emulation, a PowerPC Mac will run almost

to PowerPC

every current System 7–compatible Mac program (including control panels and INITs). Apple and developers are now testing compatibility and are finding only a few problems mostly in programs that bypass the operating system to deal with hardware themselves, Apple says.

But expect third-party developers to quickly deliver native PowerPC apps. For example, *Macworld* has seen an early PowerPC version of Aldus FreeHand that is much faster—two to three times—on a prototype Quadra-level, 80MHz PowerPC Mac than on a Quadra 900. Others developing native PowerPC applications include Adobe, Aldus, Claris, Deneba, Frame Technology, Microsoft, Quark, and WordPerfect.

Popular software will likely be sold in two versions: one for 680X0 Macs and one for PowerPC Macs. Developers also have a third option: writing applications so they run natively on both types of Macs. But this kind of software, called a fat binary, will be almost twice the size of a PowerPC-only or 680X0-only version, since a fat binary is basically both versions in one file. Apple expects large programs like word processors and illustration software to be offered either in separate 680X0 and PowerPC versions or with disks for both systems in the box, while utilities and other small applications will likely be sold in fat-binary versions that run on either CPU.

Hardware

The first PowerPC Mac will use the PowerPC 601 CPU, which was designed and first built by IBM and later by Motorola. The business-level PowerPC 601 CPU runs at 66MHz internally (but it will likely communicate with the system board at a slower rate, perhaps 33MHz, since buses faster than 50MHz are hard to design). Versions running at 50MHz and 80MHz may also be available. (Apple would not detail its product plans, saying only that the first PowerPC Macs will be Quadras.)

The PowerPC 601 costs

LUIS DELGADO

PowerPC 601: Up close and personal with the heart of Apple's new machines.

about 30 percent less than comparable Intel 80486 CPUs used in most PCs because it's smaller; the same size silicon wafer yields more 601 CPUs than 80486 CPUs.

It also gives Apple, for the first time, a CPU as fast as leading Intel CPUs. Motorola's benchmarks put the $374 66MHz PowerPC and $950 66MHz Pentium on equal footing (the PowerPC is much faster in specialized computations but a tad slower in more common computations), while the 601 is half again as fast as the $500 66MHz 486DX2 CPU now used in high-end business PCs.

The first PowerPC Macs themselves will likely use Centris and Quadra cases and standard sets of basic parts. Last year Apple decided to standardize on the cases used in the LC III, Centris 610, IIvx/Centris 650, and Quadra 800. That makes upgrades easier to design and anticipate: Apple has committed to providing a system-board upgrade for newer Macs—the Quadra 800, Centris 610 and 650, and the IIvx.

Gone—but not missed—from PowerPC Macs will be the FPU, since the PowerPC chips perform floating-point math calculations so quickly that they don't need it.

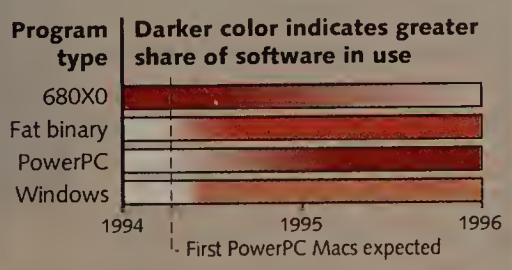
continues

Estimated Availability for PowerPC Software

Because PowerPC Macs are being designed to run existing Mac software as well as PowerPC-specific software and even Windows software, people will likely use several types of programs simultaneously.

While waiting for PowerPC native applications, most PowerPC users will run their existing 680X0 Mac software. Vendors may choose to sell small applications in a form called fat binary that can run on both 680X0 and PowerPC Macs. When Insignia Solutions releases its Windows interpreter for PowerPC, Mac owners will be able to run Windows programs not available on the Mac.

The graph below estimates the mix of programs most users will likely have on their PowerPC Macs over the next two years.



In Brief

DigitalFilm 1.5
SuperMac is shipping a free software-only upgrade to its DigitalFilm product that brings the digital video system display rates up to 60 fields per second. Sound syncing has also been improved. 408/541-6150.

Print Shop Deluxe
With The Print Shop Deluxe for the Mac, users can make greeting cards, signs, stationery, calendars, and banners. The $44.95 package has over 300 graphics and 30 TrueType fonts; users can customize the graphics, import PICT files, and create special text effects. To ship this fall from Brøderbund, 415/382-4400.

HyperStudio
This do-it-yourself multimedia project studio features animation, sound recording, and point-and-click scripting. Users can control CD-ROM drives and Pioneer laser-disc players from their presentations, and the $179.95 product includes a Logo language interpreter. Available from Roger Wagner Publishing, 619/442-0522.

Conflict Catcher II
The latest version of Conflict Catcher from Casady & Greene tests your start-up software instead of relying on tables of known conflicts. It can make a list of the demands for RAM by various extensions. Now shipping, the $79.95 Conflict Catcher II requires System 7 or later. 408/484-9228.

Gray Plate Special
Techöggin is shipping three rechargeable PowerBook batteries. Two, the Powerplate 5x ($299.95) and 3x ($239.95) attach under the PowerBook, while the Mini 3 ($169.95) is about half as big and fits in a briefcase or PowerBook carrying case. All three batteries plug into the AC power jack. 513/321-1777.

But that means any 680X0 application that requires an FPU will not run on a PowerPC; you'll have to get a PowerPC-specific software upgrade or use a slow software FPU emulator.

Apple will have to rework its virtual memory scheme in System 7 to be compatible with the PowerPC's built-in memory-management unit. However, Apple expects this to cause no compatibility problems, since applications won't be allowed to address this unit directly but will have to work through the operating system instead.

Down the Line

The second set of PowerPC Macs will likely be based on the PowerPC 604 CPU, which was jointly designed by IBM, Motorola, and Apple. The 604 will be built by Motorola and is expected to be twice as fast as a 601 or Intel's 66MHz Pentium, according to Motorola. Apple may have 604-based Macs in late 1994.

Perhaps in early 1995, Macs based on the PowerPC 603 will appear. This CPU is being designed to use less power than other PowerPCs, making it suitable for use in PowerBooks and low-cost computers. The 603's performance is expected to fall between that of the 601 and 604.

A fourth PowerPC CPU, the 620, will go in workstation-level Macs that push the high end of performance. But workstation-level Macs don't seem a high priority at Apple, which has left this market to Unix workstation developers like Sun Microsystems, IBM, and Silicon Graphics.

Other PowerPC Computers

IBM and others are also developing PowerPC-based computers that will run their own operating systems. One such operating system is PowerOpen, a version of Unix based on Apple's A/UX and IBM's AIX that will run both Macintosh System 7 and OSF/Motif applications. Several vendors will offer PowerOpen-based Unix workstations.

Other PowerPC-based computers won't run Mac software. For example, IBM plans to deliver by year's end prototypes of PowerPC PCs that use its new Workplace OS, which is based on the OS/2 operating system.

Related Apple Changes

Apple has announced other strategies that will interplay with the PowerPC.

- All Macs will eventually include the audiovisual technology introduced this year with the AV Macs. But you should expect some PowerPC Macs to ship with AV technology and some, without.
- Apple will eventually switch from NuBus to Intel's PCI bus, which most PC developers say they will use. But probably not until 1995.
- Apple will license parts of its operating system software, but it won't say whether that means other companies will sell Mac-compatible PowerPC computers or that certain portions (such as QuickDraw/GX) might be available on other platforms to ease interoperability.

PowerPC's Importance to Apple

PowerPC represents a make-or-break strategy for Apple. Apple has seen profits erode because of price-cutting required to compete with cheap, powerful Windows PCs. It has seen Windows go from a laughingstock to an interface that garnered 22 million users in two years versus Apple's 10 million in ten years. And it has seen its core 680X0 CPUs outstripped in terms of performance by Intel's 486 and Pentium series.

Making the transition from the Macintosh to PowerPC, coupled with as-yet-vague plans to be more interoperable with the PC universe at large, is Apple's attempt to put the Mac ahead of Intel and Microsoft both technologically and economically. It's a risky move, but the potential payoff is huge—for Apple and Mac owners alike.—GALEN GRUMAN

TREND

CD-ROMs for Rent

A REVOLUTION?

PETER ALSBERG

With some CD-ROM titles costing hundreds of dollars, it's comforting to know you can now rent or borrow a disc. Compton's NewMedia, which distributes the $395 Compton's Interactive Encyclopedia, among others, has begun offering 22 of its titles for rent in 35 video stores across the country. The company's goal is to expand the number of video outlets to 100 by the end of 1993. Under current law, renting software is illegal without the approval of the publisher. Compton's says it has obtained the necessary approval from the developers of those CD-ROMs it publishes.

Compton's is also offering discounts on its reference, music, travel, business, and children's storybook titles to public libraries, so that libraries can easily make Compton's CD-ROM titles available for loan.

The discs made available to video stores and libraries will be specially marked For Lending Only. Compton's NewMedia, 619/929-2500, 800/862-2206.—JAMES A. MARTIN

20-inch Display under $1800

RASTEROPS CHOPS PRICE ON CLEARVUE/15

Heating up the battle for your display dollar, RasterOps has begun shipping a 20-inch monitor that the company says provides better clarity and color fidelity than other similarly priced 20-inch monitors. The RasterOps 20/20 Multimode Color Display offers digital controls (including brightness, contrast, size, position, and a recall button to return to factory presets), .31mm dot pitch, and 9 sync modes with a maximum resolution of 1152 by 870 pixels, all at a suggested list price of $1949.

On the monochrome monitor front, RasterOps dropped the suggested list price of its ClearVue/15 Portrait Display from $649 to $499. The 15-inch monochrome/gray-scale monitor runs either with a display adapter or with the built-in video of a Mac II, Centris, or Quadra system. RasterOps, 408/562-4200.—JIM FEELEY

MARK JOHANN

The RasterOps 20/20 Multimode Color Display has digital controls.

One-Touch Telecom?

WITH STUFFIT ENGINE

With a name that sounds like a contradiction in terms, a telecommunications program from Aladdin Systems, called Simply Intuitive Telecommunications (or SITcomm), is designed to flatten the online learning curve. The $120 product revolves around a user-defined address book of online services. When setting up an address to a supported service like CompuServe, users type in the connect number, plus their account and password, and SITcomm handles the log-on procedure. The product supports most major services, plus boards running Mac or DOS BBS software such as First Class or Easy Link. The product does TTY, VT102, and VT52 terminal emulation; supports Xmodem, Ymodem, and Zmodem file transfers; and using an internal StuffIt engine, automatically stuffs, unstuffs, and translates most major Mac, PC, and Unix file formats, including BinHex, CompactPro, ZIP, ARC, tar, and uucode. SITcomm has no macro or scripting language of its own but can be recorded with AppleScript. Available now. Aladdin Systems, 408/761-6200.—CAMERON CROTTY

TOM GIBSON

The ZyCellular Portable fax modem from ZyXel sends and receives data and faxes.

Cellular Fax Modem

LIGHT SPEED

When you just can't wait to telecommunicate, the ZyCellular Portable is a small fax modem that transmits and receives data at 14.4 Kbps and faxes at 14.4 Kbps over cellular phones. The data modem is V.32bis, V.42, V.42bis, and MNP 3 through 5, compliant, while the fax modem is Group III–compliant. The product ships with the company's fax/data software. Available now from ZyXel for $649 including cellular capability; 714/693-0808.
—CAMERON CROTTY

Quadra 040 Vroom

ACCELERATOR

Some people are never satisfied. It's not enough that you've got one of the fastest Macs in the known universe (barring any recent Apple product announcements), but you have to add an accelerator. The Quad 040, from DayStar Digital, adds a 40MHz 68040 processor and a 128K SRAM cache to the Quadra 700, 800, 900, and 950; the Centris 650; and the Centris 610 and 660 with an adapter card. The Quad 040 plugs into the Quadra PDS slot, and Quadra 700 users can purchase the $99 SlotSaver, which plugs directly into the CPU socket and includes a slot for the Quad 040.

The Quad 040 provides DayStar's Quadra Universal Interface Connector (QUIC) for future expansion; Spectral Innovations (SI) is working on a daughterboard using the same DSP chip that's in the AV Quadras and Centrises. Software that addresses this chip in the new machines will automatically work with the SI daughterboard, except for voice recognition and telephony applications. The Quad 040 also comes with Auto-Cache software for switching between 030 and 040 cache modes. If you need more imaging acceleration punch, DayStar offers the Image 040, which is a Quad 040 with two DSP chips plugged into the QUIC slot. The Quad 040 retails for $1899, and the Image 040, for $2699. Both cards are currently available. Charger Quick, a module that upgrades the Quad 040 to the Image 040, lists for $799. DayStar Digital, 404/967-2077.
—CAMERON CROTTY

THE AMCOEX INDEX OF USED MAC PRICES

Machine/RAM/Hard Drive	Average Sale Price	Monthly Change
Mac SE/2MB/20MB	$500	$0
Mac Portable/1MB/40MB	$700	–$50
PowerBook 100/4MB/40MB	$850	–$50
PowerBook 140/4MB/40MB	$1275	+$75
Mac Classic/2MB/40MB	$550	$0
Mac SE/30/2MB/40MB	$775	+$25
Mac LC/2MB/40MB	$600	–$100
Mac II/4MB/40MB	$650	–$100
Mac IIsi/3MB/40MB	$950	–$25
Mac IIcx/4MB/80MB	$1100	–$50
Mac IIci/4MB/80MB	$1450	$0
Mac IIfx/4MB/80MB	$1700	$0
Apple 12-inch B&W display/board	$125	$0
Apple 13-inch RGB display/board	$350	–$25
LaserWriter Plus	$575	–$25
LaserWriter IINT	$825	–$50

Index provided by the American Computer Exchange of Atlanta, Georgia (800/786-0717). It reflects sales during week of August 20. Configurations include keyboard and exclude monitor and display board for noncompact models.

In Brief

A Home for Lost Files

Orphan Finder 1.5 is a utility that finds files that were abandoned when the applications that created them were removed. The utility can find foster-parent applications, make lists of orphans, and change file creator types. Capable of running at a predetermined time, Orphan Finder is shipping for $69.95. Tuesday Software, 805/962-7889.

Newtonian Memories

If your Newton MessagePad is already having trouble remembering names and numbers, you might refresh its memory with a 2MB PCMCIA RAM card from Lifetime Memory Products. The card lists for $279, and its batteries are designed to last one to four years. 714/969-2421.

Aladdin Desktop Tools

Aladdin Systems has announced a set of eight system customization and organization utilities. Benefits offered by these utilities include faster file copying, instant access to printers via desktop icons, a delete function that more thoroughly erases files, and a library of colorful Finder icons. Available in the fourth quarter from Aladdin Systems for $89.95. 408/761-6200.

WealthBuilder 3.0

Reality Technologies has announced an upgrade to its personal financial planning and investing software. Major enhancements include expanded access to the Reality Smart Investor Network online service (with a personalized news-clipping service); a redesigned central interface; a Front Page, which provides users with a snapshot of their current status as well as user-definable navigation buttons; and improved graphing capabilities. Available in November for $69.99 from Reality Technologies, 215/277-7600.

Tiny Card, Big Color

16 BITS FOR LCS

Take a Macintosh LC, add a card in the VRAM slot, and you might think you're stuck at 8-bit color, but not with the ColorBlaster LC from DGR Technologies. This little card pumps up your Macintosh LC, LC II, Performa 400, 405, or 430 to 16-bit color, and includes a hardware zoom capability—you can enlarge the upper quarter of your screen to fill the entire monitor without paying any penalty in speed. The ColorBlaster works with Apple 12-, 13-, and 14-inch monitors and allows users to connect a standard VGA monitor directly to their Mac's video-out port with only a cable adapter. The card ships with an enabling extension. Available for $249 from DGR Technologies; 512/476-9855.

—CAMERON CROTTY

Desktop Video-conferencing

AV MAC DSP AND GEOPORT REDUCE PRODUCT PRICE

Nuts Technologies announced in August a desktop videoconference system that takes advantage of the new technology in Apple's recently introduced Centris 660AV and Quadra 840AV. The Connect 918AV Desktop Video Conferencing System comes with a camera, speaker, and CODEC board and uses the GeoPort connector and DSP chip in either of the AV Macs to deliver live video conferences. Pricing was not set at press time but should be several hundred dollars less than the currently shipping version for NuBus. The company hopes to ship the product by year's end. Nuts Technologies, 408/441-2166.

—SUZANNE COURTEAU

The Tahoe-130 from Pinnacle is a 128MB portable optical drive.

Destination: Tahoe

PORTABLE OPTICAL

The $999 paperback-size Tahoe-130 is an ISP/ANSI-standard, rewritable optical disk drive that uses 128MB 3½-inch disks. A 256K RAM cache and a seek time of 28ms, according to the company, make this drive fast on the desktop or on the road. Pinnacle also offers an optional battery pack for $199. The battery pack gives the Tahoe-130 approximately 3½ hours of life with normal computer use, for another pound of weight. An indicator light gives warning well before the battery runs out.

The Tahoe-130 is available now; no disks ship with the drive, but they're available for $69 each, or two for $59 each. Pinnacle Micro, 714/727-3300, 800/553-7070.

—SUZANNE COURTEAU

Atto Multiplies SCSI

SCADS OF STORAGE

You know that the free ride on the Macintosh SCSI bus is over when you've got more devices than you can count on two hands. To combat the problem of too many devices and too little bus space, Atto Technology has introduced the SCSI Expander, which translates SCSI Logical Unit Numbers (LUNs) into additional SCSI bus IDs. Users can connect up to 7 devices to a single SCSI Expander, which takes up only one SCSI ID, for a total of 49 possible devices on a single Mac. Readers should note that the Mac SCSI Manager does not currently support LUNs, so a LUN-capable SCSI-2 card is required. The SCSI Expander is SCSI-2 Fast capable, and each port (in and out) can be independently configured via a daughterboard for either differential or single-ended SCSI (differential SCSI allows for longer cable lengths). The internal version of the device retails for $995; the external version's price was not available at press time but should be under $1500. Configuring the device for differential SCSI costs an extra $100 per port. Atto Technology, 716/688-4259.

—CAMERON CROTTY

Hold My Calls, Mac

PHONE CONTROL

Supra's Desktop Communicator adds voice-handling to its V.32 and V.32bis fax modems. The product ships with the Supra Answering Machine (SAM) software, and the package can record messages to your Mac's hard drive for local or remote playback. You can have different messages, and private messages for friends or colleagues. SAM also supports Caller ID and will keep a database of numbers. The Supra Desktop Communicator will be available this fall for under $400, and Supra V.32 and V.32bis owners can upgrade for $99. Supra, 503/967-2400.

—CAMERON CROTTY

BUGS & TURKEYS

PowerBook users report that the 160, 165c, and 180 may have problems awaking from sleep when serial ports are being used by modems. Apple's System Enabler 131 version 1.0.3, released for the PowerBook 180c, fixes this. Enabler 131 works on all four machines.

Claris has released MacWrite Pro 1.0 v4 to correct bugs in the original. The free maintenance release corrects problems with printing footers on QuickDraw printers and converting MacWrite II documents to MacWrite Pro format. It also corrects the problem with the table editor using a Mac Classic running System 6 (see "Bug Report," *News*, *Macworld*, August 1993).

Make sure your coworkers upgrade to ClarisWorks 2.0 when you do—there's no option to Save As ClarisWorks 1.0. Claris is working on a fix; interested users should call for the new text filter.

Don't expect to store your DesignCAD documents anywhere besides the folder in which the application resides. If you try to Save As to another location, the program places a new version of the document in the DesignCAD folder. Also, double-clicking on a DesignCAD document opens an import utility—not the application. American Small Business Computers promises fixes in a future release.

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-Shirt if we shoot your turkey in this space. See *How to Contact Macworld*.

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Circle 64 on reader service card

"I DON'T NEED (tick) YOUR DATA (tick) PROTECTION SOFTWARE (tick). I'VE HAD MY MAC (tick) FOR YEARS AND (tick) IT HASN'T CRASHED (tick) YET."

Not to alarm you or anything. But if a lot of wishful thinking is all that's standing between you and a Mac meltdown, you may want to check out a more proven method of protection.

We suggest the Norton Utilities for Macintosh v2.0. It both prevents data loss and gives you the most effective data recovery features available. In other words, it's like giving your computer its own personal bomb squad.

Without us, one crash can ruin your whole day.

For starters, let's talk prevention. The Norton Disk Doctor hunts down potential problems and lets you squash them before they become actual nightmares. Plus, Speed Disk defragments files and boosts performance of your hard disk, making data loss less likely in the first place. So far, so good.

Now, the recovery part. Our FileSaver feature keeps a record of vital disk information, which helps you rescue files if you happen to lose or delete them. On top of that, you get automatic backup. It's total security like this which has helped Norton Utilities become the best-selling data protection and recovery software in the world.

From Peter Norton, the leader in Macintosh utilities.

To learn more, dial FAST FAX 1-800-554-4403 and select option 1, document 411. (For information on easy network installation, choose option 1, document 481.) Better yet, pick up Norton Utilities at your local dealer for about $149.*

You should probably do it today, though. Before your luck runs out.

THE NORTON UTILITIES® FOR MACINTOSH
SYMANTEC.

**Suggested retail price. Actual price may vary. All names are trademarks of their respective companies. For more information in Europe, call 31-71-353111. In Australia, call 612-879-6577. In Canada, call 1-800-465-2266. Everywhere else outside U.S., call 408-252-3570. ©1993 Symantec Corporation.*

New Products

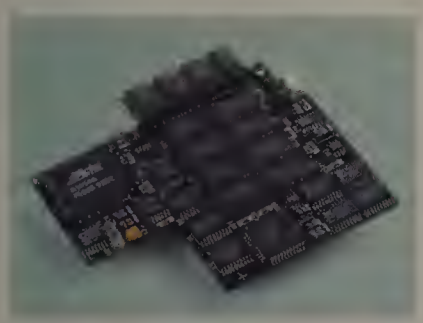
THE LATEST MACINTOSH RELEASES

by Cameron Crotty

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY *MACWORLD*. UNLESS OTHERWISE STATED, THE MINIMUM REQUIREMENTS FOR OPERATION ARE A MAC PLUS, WITH 1MB OF RAM, RUNNING SYSTEM 6. ALL INFORMATION AND PERFORMANCE CLAIMS ARE SUPPLIED BY THE PRODUCT VENDOR AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY *MACWORLD*. ALL PRICES ARE SUGGESTED RETAIL. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

HARDWARE

Cirrus 105MB Removable
Based on the 3½-inch SyQuest subsystem, this drive has an average seek time under 16ms. Each cartridge can hold up to 105MB of data, and the drive ships with one cartridge, plus La Cie's Silverlining disk utility. $689. La Cie, 503/520-9000, 800/999-0143; fax 503/520-9100.



ColorBlaster for the PowerBook

ColorBlaster for the PowerBook
You can't paint what you can't see, but this little expansion card allows PowerBooks 140, 145, 145B, and 170 to display 16-bit color on 16-inch and smaller monitors, and 8-bit color on 21-inch monitors. The product also provides 6MB of RAM expansion and comes with driver software. It draws battery power only when it's plugged into an external monitor. $999. DGR Technologies, 512/476-9855, 800/235-9748; fax 512/476-6399.

CommonSense CAM
As everyone read in the hit book *101 Uses for QuickTime*, a navigable movie allows users to control their view from a fixed point in space. This package has nearly everything you need to make your own navigable movies—just add a camcorder and a video-digitizing card. After you've mounted your camcorder on the pan/tilt head, you select the number of frames you want horizontally and vertically. The software then directs the control unit (attached to the printer port) to swivel the camera; the camera captures an image at each position and creates a completed movie. $2950. Radiant Enterprises, 415/296-8040; fax 415/392-6860.

EtherLAN Print and EtherLAN+
Isn't it funny how a little thing like a LocalTalk interface on a printer can prevent you from hooking it up to an EtherTalk network? These units let you do that, and they can be configured for thin or UTP Ethernet cabling. EtherLAN Print has two LocalTalk printer ports, while EtherLAN+ has six. EtherLAN Print $299; EtherLAN+ $399. Focus Technologies, 617/938-8088, 800/538-8866; fax 617/938-7741.

FastPort 3000 and 3100
Argh. You've got a great serial or parallel-port printer, but you can't attach it to your EtherTalk network—or can you? These print servers allow you to print to your serial or parallel printer simply by selecting it from the Chooser. Each FastPort can support one serial and one parallel printer; both printers appear to FastPort users as LaserWriters and the products support Unix, NetWare, and AppleTalk print protocols. FastPort 3000 $695; FastPort 3100 $995. MiLAN, 408/752-2770, 800/466-4526; fax 408/752-2790.

FastPort

hammerDisk1300FMF
Big files require big storage, and when it comes to big storage, 1.3GB adds up to a whole bunch of those little tiny data bits. This 5¼ inch removable-cartridge optical drive sports effective average access times under 19ms and is fully backward-compatible with 1GB and 650MB cartridges. The drive ships with the company's Hard Disk ToolKit, as well as with a single cartridge. $4799. FWB, 415/474-8055; fax 415/775-2125.

Impala 14.4K PocketFax/Modem

Impala 14.4K PocketFax/Modem
You'll look pretty foolish trying to telecommunicate with a PowerBook in one hand and a cellular phone in the other unless you've got a fax modem like this one. The product is MNP Class 10–compliant, meaning it can be used with a cellular phone, can transmit and receive at up to 14.4 Kbps (fax and data), and runs for ten continuous hours on four AA alkaline batteries. The data modem is compliant with V.32bis and V.42bis standards and MNP Classes 1 through 5, while the fax is Group III–compatible. $399. Omron, 408/727-1444; fax 408/970-1149.

MD 2003
This 2.1GB half-height hard drive features SCSI-2 Fast and comes in both internal and external models. It has an average seek time of 10ms. Internal $4495; external $4695. Procom Technology, 714/852-1000, 800/800-8600; fax 714/852-1221.

MicroProbe ADB
If your Mac doctor doesn't make house calls, this product could help you find the problem yourself. Users can test ADB fuses, chips, and filters simply by plugging this pocket-size device into the affected Mac's ADB port. Requires no batteries or other power source. $99. MicroMat Computer Systems, 415/898-6227, 800/829-6227; fax 415/897-3901.

MultiRouter
Members of this family of routers can channel data to and from LocalTalk or Ethernet (thick or thin) LANs or over WANs via a synchronous serial interface (RS-232D, RS-422, or V.35) or a V.32bis modem. The products support AppleTalk Phase 2, TCP/IP, or both. Each router ships with the company's Route Manager software. Prices range from $1495 for four LocalTalk ports to $2295 for one Ethernet and one RS-422 or V.35 port. NetSpan, 214/690-8844; fax 214/690-8840.

PerformerPro
A 25MHz 68030 accelerator for the SE and Classic, the card features a 64K cache that you can enable or disable on the fly using the included software. A 68882 FPU is available as an option. Performer Pro $199; FPU $100. Harris International, 612/482-0570, 800/783-3726; fax 612/482-0762.

PortShare Lite and Pro
Why should hard drives be the only peripherals lucky enough to be shared over a network? With PortShare Lite, AppleTalk network users can use the Chooser to access devices plugged into the serial port of any Mac on the network, including modems, printers, and scanners. The software, which installs on each participating Mac, provides password protection for each shared port, arbitrates concurrent port requests, and logs user activities. PortShare Pro gives you support for Apple Remote Access and the ability to share two ports simultaneously on one Mac. PortShare Lite $49; PortShare Pro $149. Stalker Software, distributed by Global Way, 408/866-4722, 800/262-4722; fax 408/370-3170.

SCSI-490

SCSI-490 and SCSI-490PB
If you've got a SCSI port, you can hook up to an Ethernet network with this box. The product supports thin Ethernet and 10BaseT networks, and includes LEDs for SCSI address, power on, link, send, and receive display. A PowerBook version (SCSI-490PB) connects via an HDI-30 port. SCSI-490 $279; SCSI-490PB $299.

continues

MacNet, 408/954-8888, 800/486-2638; fax 408/434-9575.

SoundEngine Music Module
Your Mac will be alive with the sound of music when you plug this MIDI sound module into a serial port. The product features 384 preset sounds (including all 128 from General MIDI level 1); built-in reverb; MIDI in, out, and through ports; and audio input and output jacks; and it can play up to 32 sounds simultaneously. $595. E-mu Systems, 408/438-1921; fax 408/438-8612.

Spectra NSF
This card plugs into your Mac's NuBus slot (including slots in the smaller Centris 610) and lets your machine hook into an FDDI network. Once there, you can send and receive your data at over 100MB per minute. An on-board processor handles network interaction without draining cycles from the CPU. The card comes with a RAM buffer and ships with the company's file-transfer utility. $2159. Spectra Systems Corp., 404/410-7803; fax 404/410-7815.

Stallion-QD+
For the faster Macintoshes, this board offers another way to the fiber-optic river. The product plugs into the PDS slot of the Quadra 700, 800, 900, and 950 and Centris 650, provides 32-bit DMA to the Quadra's main memory, and can be configured as either a Single Attached Station (SAS) or a Dual Attached Station (DAS). The board comes with the company's FiberTalk Pro network software

Stallion-QD+

for linking your Quadra FDDI node directly to an AppleTalk network, a multiplatform TCP/IP-based network, or to another Stallion-equipped Mac for high-speed node-to-node file transfers. An internal Fast and Wide SCSI-2 port is optional. SAS with SCSI-2 port $2495; DAS $2495; DAS with SCSI-2 port $2795. Team ASA, 619/279-2316; fax 619/292-1377.

TelePort/Bronze II
This stripped-down, low-cost fax modem features a 2400-bps data modem and a 9600-bps–send/4800-bps–receive fax. The fax is Group III–compatible, and the modem is compliant with MNP Classes 1 through 5 and V.42. The product plugs into the serial port, draws its power from the ADB port, and ships with MicroPhone II and Faxstf. $109. Global Village Communication, 415/390-8200, 800/736-4821; fax 415/390-8282.

TransWarp 6400
This line of 68040 accelerators fits the Macintosh IIsi, IIci, IIvi, IIvx and Performa 600 and has models that run at 25MHz, 33MHz, and 40MHz. The card plugs into the PDS and comes with a 128K cache. The IIsi version requires an adapter. 25MHz with FPU $999; 33MHz with FPU $1199; 40MHz with FPU $1499; IIsi adapter $49. Applied Engineering, 214/241-6060, 800/554-6227; fax 214/484-1365.

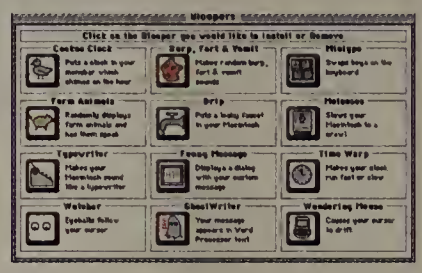
UC1260
This 24-bit color, three-pass, SCSI flatbed scanner can handle up to 8½-by-11-inch originals at 600-by-1200-dpi optical resolution. The product ships with Adobe Photoshop. $2495. Umax Technologies, 510/651-8883, 800/562-0311; fax 510/651-8834.

SOFTWARE

Academic DataManager
If you don't note where your quotes come from, your readers might not find your quotes so notable. This database software creates fully formatted bibliographies and footnotes in four common styles, and tracks library materials; music; videotapes; and notes from lectures, books, and research. $39.50. Kal-Marx Software, 202/686-0409, 800/296-6279; no fax.

AgentBuilder
With this software, you can create stand-alone agents that provide script-execution and communications facilities for applications that are Apple events–savvy and comply with Open Scripting Architecture (OSA). Uses include gathering, filtering, and redirecting information between applications. Agents can be developed, tested, debugged, and altered while they're running. 2MB min. memory; requires System 7. $295. Full Moon Software, 408/253-7199; fax 408/252-2378.

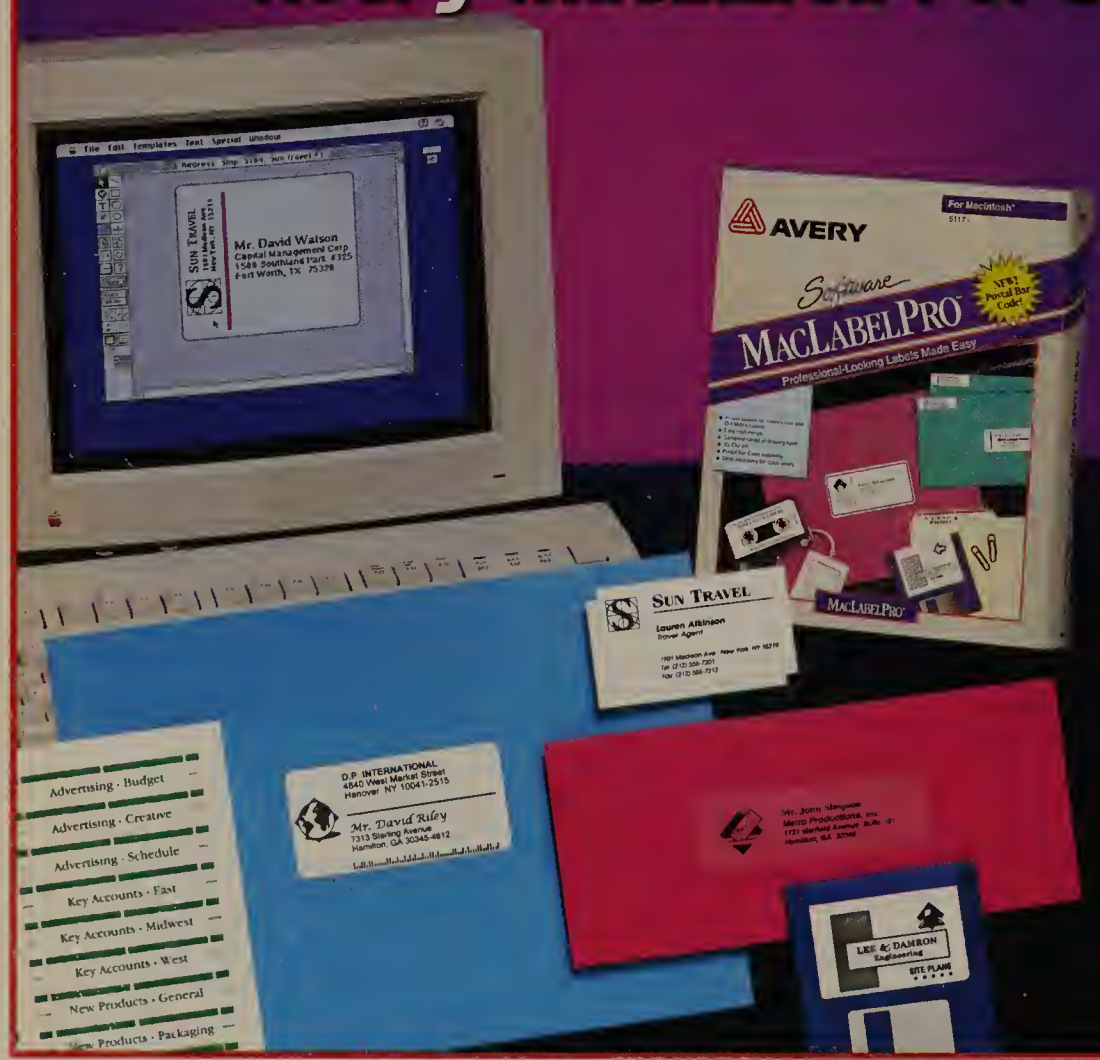
Bloopers
Sometimes you just get a hankering to do something goofy, something tricky, something just plain silly. With the help of this package, you can let the prankster in you roam free, planting jokes like Watcher and Cuckoo Clock on your office mates' Macintoshes. Just make sure you keep the master disk somewhere safe: it wouldn't do for this software to fall into your coworkers' hands. $25. Binary Software, 310/451-9044; fax 310/451-0315.


Bloopers

Bridge Series
This line of software bridges lets you connect LocalTalk devices to extended networks through a host Macintosh. PowerBridge can handle one LocalTalk device, SuperBridge can handle ten, and

continues

Avery MacLabelPro. Simply Brilliant!



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Avery MacLabelPro™ gives you everything you need to design and print Avery labels, index dividers, business cards and more in minutes. Just choose the product you want, add your text and design elements, choose your mailing list and print. It's that simple. And the results are simply brilliant.

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AVERY

Circle 197 on reader service card

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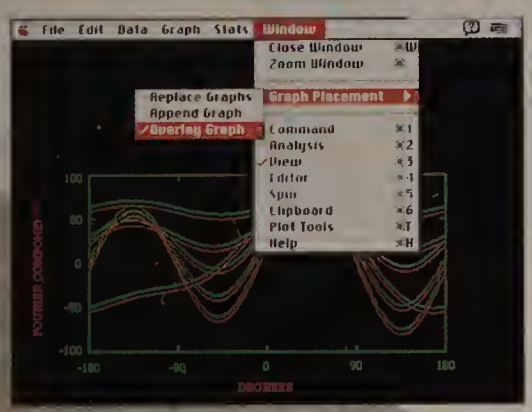
MACWORLD MW EDITORS' CHOICE

NEW SYSTAT 5.2

"For Mac-based statistical analyses and presentations, choose SYSTAT."
P. Wayner, **BYTE**, 1-92

The most comprehensive and powerful statistics software for Macintosh now provides the most advanced multivariate general linear hypothesis program. Yet it remains the easiest to use–with a friendlier-than-ever interface.

New SYSTAT 5.2 for Macintosh enables you to perform statistical analyses you can't do with any other Macintosh statistics program. It offers more advanced statistical procedures, more types of graphs, and greater data management capabilities.



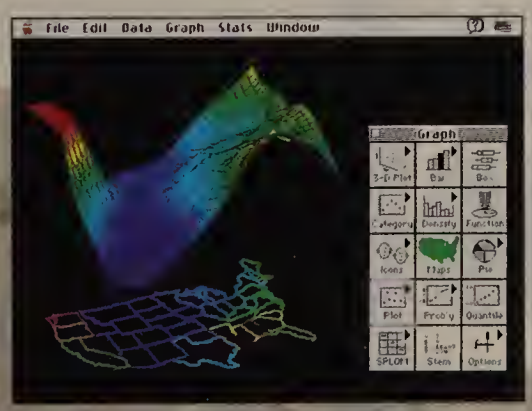
More statistics, from basics to the most sophisticated

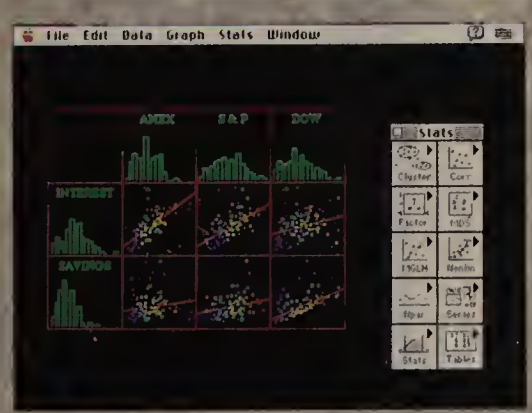
A full range of univariate and multivariate statistics–including multidimensional scaling and nonlinear modeling.

Basics include descriptive statistics, *t* tests, correlations, auto-correlations, simple regression, and frequency tables. With a few clicks you can turn each statistic into a graph.

SYSTAT offers the most advanced multivariate general linear hypothesis program available for Macintosh. SYSTAT can estimate and test any univariate or multivariate model including:

- REGRESSION: simple linear, multiple linear, stepwise, polynomial, mixture, and weighted;
- ANOVA (analysis of variance): one-way, two-way, factorial, nested, unbalanced, post-hoc tests, mixed, repeated measures, split plot, multivariate, means model coding;
- MULTIVARIATE: discriminant analysis, principal components, canonical correlations.





Just point and click

SYSTAT is truly Mac-like. Just point and click: SYSTAT works with the pull-down menus, dialog boxes, icons, buttons and graphics tools you're accustomed to on the Mac.

The most graphics

No other statistical or graphics package can produce all the scientific and technical graphs available on SYSTAT–nor surpass its ease of use. And you can save SYSTAT graphics and data in QuickTime™movie file formats. Graphics options include:

- linear, quadratic, step, spline, polynomial, LOWESS, exponential, and log smoothing
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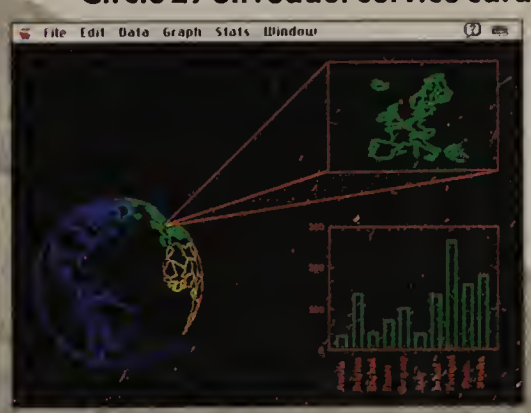

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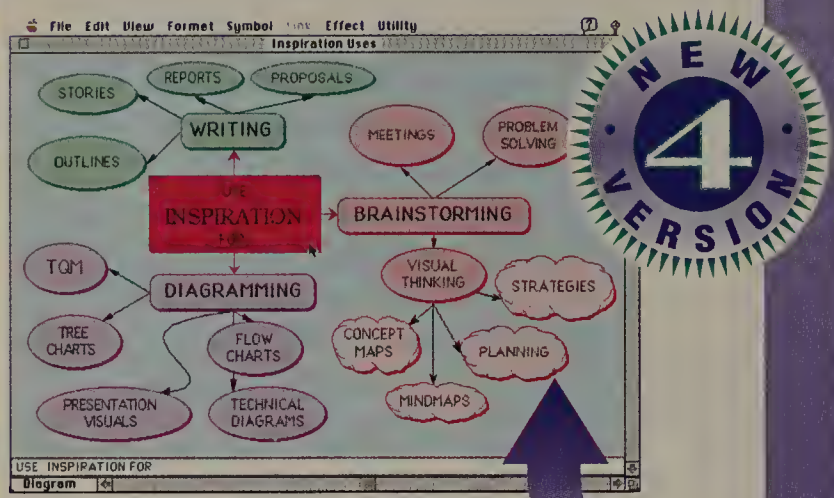

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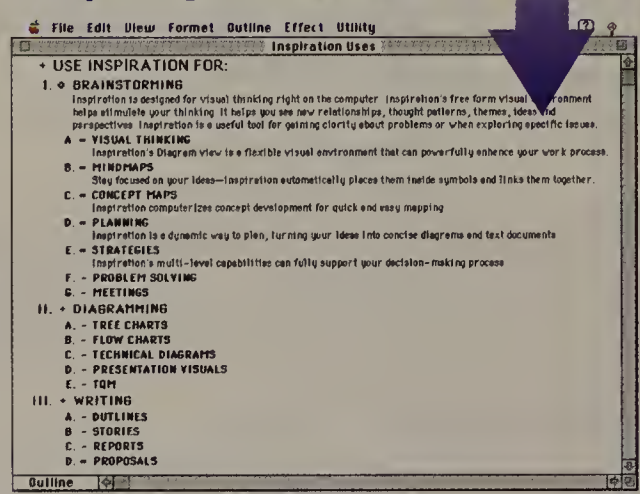

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LaserBridge can connect ten printers. TCP/IP services are available for an additional $100 per product. 2MB min. memory; requires Mac SE. PowerBridge $149; LaserBridge $199; SuperBridge $249. Sonic Systems, 408/736-1900; fax 408/736-7228.

Digital Video Link Pro

Digital Video Link Pro
This software lets you output files in standard Mac graphics formats (including PICT and PICS files, QuickTime movies, and CCIR 601 digital-video files) to Exabyte's 8mm tape drive and to Abekas digital disk recorders. The Abekas final output is of broadcast-quality and can be sent directly to a post-production house. A limited-edition Exabyte-only version is also available. 5MB min. memory; requires System 7 and color. $1199; Limited Edition $599. Mae Software, 416/516-1117; fax 416/516-1119.

DriveTech
You shouldn't copy that floppy, but maybe you ought to check your drive more often. This package contains software and test disks that work together to check your drive head's read and write accuracy. 3M's Head Cleaning Diskette Kit is also included. 2MB min. memory. $59.95. MicroMat Computer Systems, 415/898-6227, 800/829-6227; fax 415/897-3901.

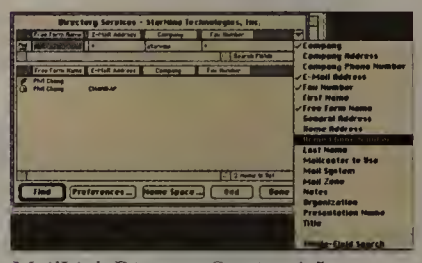
FibreLink
With this Chooser-selectable PostScript printer driver, you can print to high-speed Xerox laser printers via Entire's Fibre gateway. 2MB min. memory. $250. Entire, 716/381-7500; fax 716/381-1718.

HighWire
One of the first applications to work with Adobe's Acrobat document-distribution system, this software resides on the server and distills Acrobat PDF files from PostScript files. Users select icons from the Chooser to send files to the HighWire server. The resulting files can then be printed, filed, or sent to other HighWire servers. HighWire for Color incorporates the OPI services and color management of the company's OPI server, Color Central. HighWire Client connects remote sites to the HighWire server. 4MB min. memory; requires Mac II and System 7. HighWire $1295; HighWire for Color $5995; HighWire Client $295. Compumation, 814/238-2120, 800/776-6537; fax 814/238-2246.

MacEsquire
Lawyers wishing to subject themselves to the rule of software should check out this legal-practice–management system. The product performs all time- and disbursement-billing functions, and maintains a matter library and online legal reference. The latest version lets users store clones of master documents with related matters, and adds user-definable record types. $795. Synergy Marketing Communications, 516/935-9151; fax 516/935-9151.

MacHam Morse
As part of the MacHam series of testing programs, this software prepares you for the Morse code section of the FCC Amateur Radio License Exams. The program includes Morse code lessons (including Q-signals and QSO practice tests), games, and optional windows displaying commonly used abbreviations. You can adjust word speed in wpm, frequency in Hz, Farnsworth spacing in wpm, and the sending speed of QSOs over a selected period of time. 2MB min. memory. $39.95. Coyne Company, 714/855-4689; no fax.

MailLink Directory Services 1.5
If your E-mail needs help navigating your gateways, you might be in the market for a directory services product. MailLink searches for addresses across multiple platforms and mail programs, including QuickMail, Microsoft Mail, and cc:Mail. This new version includes a new Find interface for CE Software's QuickMail with multiple-field search and viewing options, as well as the option to access Unix and NetWare MHS addresses and directories (with the appropriate add-on modules). $2995 per server bundle; Unix Access Module $995; MHS Access Module $495. StarNine Technologies, 510/649-4949; fax 510/548-0393.



MailLink Directory Services 1.5

MailLink for MacX.400/MS
A killer E-mail application and a blazing-fast network don't mean much if your mail can't get there from here. This gateway connects Microsoft Mail on the Macintosh to Apple's X.400 Message Transfer Agent, MacX.400 (versions 1.0 and 1.1). The product features aliasing of full Microsoft Mail user names, administrator-selectable mapping of outgoing enclosures, and support for bidirectional return receipts. $595 for ten users. StarNine Technologies, 510/649-4949; fax 510/548-0393.

MacWire
For the guy who just can't wait to read the newspaper, this software receives, filters, and displays feeds from news wires that conform to ANPA Bulletin 1312 format, including Knight-Ridder/Tribune, AP, UPI, Reuters, and others. The software accepts telephone or FM transmissions (hardware not included), and flags appropriate news stories based on keyword tables created by the user. 2MB min. memory. $995. Mainstream Data, 801/548-2800; fax 801/584-2831.

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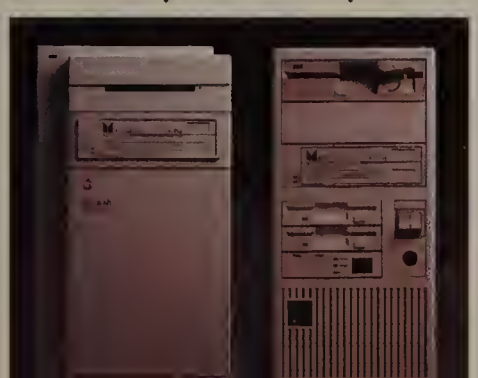

MountainGate

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NAServer Administrator 1.4
With this software, users can administer a DEC Pathworks network from the Mac desktop. The new version features support for PCSA Groups, online help, data export, and support for X.400 details. Single server with 20 users $600; unlimited users $4550. Webster Computer Corp., 408/954-8054, 800/457-0903; fax 408/954-1832.

Replicas: Volumes 5 and 6
The next two installments in the Replicas collections of models, surfaces, and image maps are designed for use with Specular International's Infini-D three-dimensional modeling, rendering, and animation package. Volume 5 is a collection of over 25 packaging models, ranging from soda cans and cereal boxes to videocassettes and toothpaste tubes. Volume 6 contains more than 35 patterned, tilable image maps that can be applied to objects or used as backgrounds or bump maps. $179 each. Specular International, 413/253-3100, 800/433-7732; fax 413/253-0540.

SafeDeposit Server
Are you serving without a net? Chewing your fingernails, hoping your data doesn't start doing the big electronic death dance every time the power flickers? This automated backup application for AppleShare file servers will back up an AFP-compliant server volume to any media that can be mounted on the Macintosh desktop. The software can make backups based on individual files and folders, as well as on AppleShare users and groups. $449. Dayna Communications, 801/269-7200; fax 801/269-7363.

Shell Game
The eighties may be behind us, but greed lives forever. Why not fritter away a few precious hours of the feel-good nineties chasing after money? Find hidden coins under the game board's tiles before time runs out. A numerical display tells you how many coins are hidden around a given tile, but in the higher levels the display might not be telling the truth. When you're after money, you can't even trust your computer. $34.95. BugByte, 302/994-1502, 800/284-9220; no fax.

Shell Game

Sneak Preview
Finder icons are great, but sometimes they just don't say enough about a document. Sure, it's a PICT, but what's it a PICT of? This software creates 128-by-128-pixel previews of documents that pop up when you hold down a customizable hot key and highlight the document's icon. Previews can be created automatically or only on demand, and they are transported with the document, even from Mac to Mac. The software recognizes PICT, TIFF, EPS, JPEG, QuickTime, text, sound, and other document types. 4MB min. memory; requires Mac SE, System 7. $129.95. Logical Solutions, 612/659-2495, 800/645-2495; fax 612/659-2498.

Space Madness
Great Globs of Screaming Galactic Death! More evil nasties from the next dimension (or universe, or whatever) have invaded our galaxy. Millions of Right-Thinking People are counting on you (and your quick trigger finger) to save them from destruction, enslavement, and other fates too horrible to contemplate. Take the helm in this shoot-'em-up and blast through space, destroying enemy ships and bases while gathering fuel, raw materials for your ship's repairs, and yummies to pump up your ship's capabilities. 2.5MB min. memory; requires Mac II and 8-bit color. $49.95. High Risk Ventures, 503/746-0771, 800/927-0771; fax 503/746-0747.

SuperVisor LANScape 3.0
Visual learners will be happy to hear of the new version of this AppleTalk LAN-mapping software. The product plots network topologies that network managers can edit, adding paint and PICT files, clip art, or schematics. Using either the SuperVisor Responder or Apple's Responder, managers can collect hardware and software data, including system configurations, installed software, hard drives, and specifics on processors and NuBus boards. 1.5MB min. memory. $295. CSG Technologies, 412/471-7170, 800/366-4622; fax 412/471-7173.

Working PrintLogger and Working PrintStamper
The first of this pair of bundled extensions keeps a log of documents that have been printed by the computer it's installed on. Each log entry contains a sequential item number, the time and date, the number of pages, the document name, and the printer used. The second extension prints an item number, time, date, document name, and computer of origin on each page of printed documents. Control panels for both extensions let the user or administrator control the format and kind of data printed. $49.95. Working Software, 408/423-5696, 800/229-9675; fax 408/423-5699.

Wallpaper Light & Dark
Covering your Mac's monitor, even when it's asleep, this screen saver can run all After Dark modules (except the Star Trek ones), all Dark Side modules, and all Intermission modules. In addition, the product can display randomly (or selectively) changing Wallpaper patterns. The software puts your Mac to sleep when you touch a key or move your mouse to a designated sleep corner. Password protection is available. $69.99. Thought I Could, 212/673-9724; fax 212/260-1194.

Feet

Slumping, slouching or sagging posture while seated at your computer can be related to the positio

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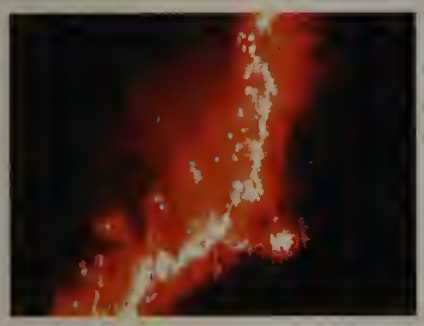
CD-ROMS

ProPhone
No little black book, this national telephone directory stretches across seven discs, and contains the telephone numbers, complete mailing addresses, classifications, and approximate number of employees for 77 million businesses, organizations, and residences in the United States. Using the included software, users can search by any field and can export records in comma-delimited, SYLK, DBF, and FileMaker Pro formats. $449. Pro CD, 617/631-9200, 800/992-3766; fax 617/631-9299.

Pyromania! Playing With Fire
Playing with fire can get you burned, but this disc is filled with flames as cool as digital video. Users get 19 fire effects, including explosions with shock waves, burning film, walls of fire that wipe across the screen, explosions with simulated flak, small explosions, and fire that comes at the camera. All effects are photographed and then digitized into a series of 24-bit PICTS (640 by 480). QuickTime movies of all 19 effects are included. $199.95. Visual Concept Engineering, 818/367-9187; fax 818/362-3490.


Pyromania! Playing With Fire

Syndesis 3D-ROM
Sick and tired of creating your own 3-D objects? This ISO-9660 format disc contains a library of over 600 three-dimensional models in several formats, including AutoCAD, DXF, 3D Studio, and Wavefront objects. There are automobiles, aircraft and spaceships, humanoids, and more. Users also get more than 400 tilable, wrappable texture maps. $199.95. Syndesis, 414/674-5200; fax 414/674-6363.

Trick of Light
A set of more than 150 backgrounds, ranging from natural subjects to the more high-tech. Each 24-bit background is saved in multiple resolutions and multiple formats from 3072 by 2048 TIFF to 640 by 480 PICT. The disc includes browsers that preview the images and gives hints and tips on how to customize them. $99. ReMedia, 619/549-8285; fax 619/536-2477.

ACCESSORIES

MacMouse
This ADB mouse has a slightly curved top and is heavier than the typical desktop mouse. It has a 220-dpi resolution and comes in both one- and two-button configurations. $59. Weingarten Gallery, 513/435-0134; fax 513/435-9087.

PowerBalls
These replacement trackballs fit all of PowerBooks (including the 100 and Duos) and come in neon yellow, orange, green, and hot pink. $9.99; four-pack $19.99. APS Technologies, 816/373-5800, 800/235-2752; fax 816/478-6506.

Power System
This battery charger offers a wide range of charging tops for different batteries. When you're done charging your PowerBook batteries (NiCad or NiH²), you can plug in another top and recharge your Sony camcorder batteries, or perhaps the ones from your cellular phone. The product features a proprietary voltage-sensing system that prevents batteries from overcharging. Base $82.95; top $24.95. Discovery Technologies, 602/443-1350, 800/824-2743; fax 602/443-7350.

BOOKS

Desperately Seeking Solutions
This resource for solving Mac hardware and software problems includes maintenance tips and routines, five freeware troubleshooting utilities, and advice on everything from system software to networks and modems. Written by Erica Kerwien. 594 pages. $29.95. Hayden Books, 317/573-2500, 800/428-5331; fax 317/573-2583.

Mac Power Toolkit
For Mac-heads who can't stop tweaking, this book describes how to enhance the Mac's memory, menus, dialog boxes, and overall system performance. Readers will learn more about QuicKeys, Norton Utilities, and other commercial utilities. The book comes with 37 utility programs on two floppy disks. Written by Maria Langer. 300 pages. $34.95. Hayden Books, 317/573-2500, 800/428-5331; fax 317/573-2583. m

Desperately Seeking Solutions

To have your product considered for inclusion in New Products, send an announcement with product name, description, minimum memory, peripherals required, pricing, company name, and phone number to New Products Editor, *Macworld*, 501 Second St., San Francisco, CA 94107. *Macworld* reserves the right to edit all product announcements.

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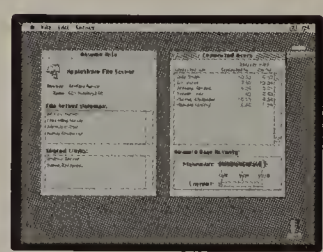
Announcing everything you'd expect in workgroup servers from Apple.

Introducing the Apple Workgroup Server 60, big support for small groups.

Introducing the Apple Workgroup Server 80, bigger support for medium-size groups.

The new Apple® Workgroup Servers 60 and 80 were designed not just to meet your expectations. They will undoubtedly exceed them.



Now, people can work together better using servers that are as easy to install and use as a Macintosh® personal computer.

Both high-performance servers allow departments and workgroups to collaborate and share files easily. So people spend a lot more time using information and a lot less time looking for it.

The Workgroup Server 60 is ideal for classroom and small-business settings. Installation is as easy as plugging it in and turning it on. And built-in networking means it fits into any office environment with a minimum of effort.

The Workgroup Server 80 is all this and more — more power and more performance for more people. An optional built-in DAT 4mm tape backup drive allows you to store gigabytes of information. It also comes with Dantz Retrospect Remote automated backup software to ensure that all your data is protected.

Both models arrive with System 7.1 and new AppleShare® 4.0 software pre-installed. Providing greater performance, ease and reliability than ever before. While products such as Farallon PhoneNET PC let MS-DOS and Windows users easily connect to any Apple server.

For still larger groups of people, we offer you the Apple Workgroup Server 95. Built around our performance-tuned UNIX®-based system software, A/UX® 3.0.1. And optimized to deliver stable, dependable file, print and database services.

No matter how many people you need to bring together, Apple provides a way to make it easier for them to share their ideas and information.

But then again, what else would you expect?

**Price based on manufacturer's suggested retail price and is effective August 30, 1993. Actual purchase price may vary. Prices for the Apple Workgroup Server 60 with 8MB of RAM and a 230MB hard drive and the Workgroup Server 80 with 8MB of RAM and a 500MB*
†AppleShare administration averages $10,000 per year less than other systems, according to the Business Research Group (BRG) study "Lifecycle Costing for PC LAN Administration — A Comparative Analysis of 5 Leading NOS Environments." Environments compared
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And a few things you wouldn't.

Introducing the Apple Workgroup Server 60, a complete solution including file-server software for under $3000.

Introducing the Apple Workgroup Server 80, a complete solution including file-server software for under $5500.

Clearly, the Apple Workgroup Servers 60 and 80 were built to meet the demands of every workgroup size.

What you may not have realized is how well they fit into every workgroup budget.

Because the simple fact is that all this power and flexibility come with remarkably affordable price tags.

Unlike comparably priced servers, Apple servers begin as complete systems. So you avoid the hidden cost of adding extra features we make standard. Such as file-server software and memory, as well as Ethernet and SCSI ports.

At under $3000, the Workgroup Server 60 is designed for small groups with even smaller budgets. The Workgroup Server 80, at under $5500, makes an equally attractive solution for larger groups.

And because they're so easy to use and manage, they demand much less attention from network supervisors. In fact, an independent study showed that Apple servers deliver dramatic savings in the categories of support and training.†

Of course, your budget isn't the only thing we support at Apple.

The AppleAssurance℠ program provides free 24-hour, 7-day-a-week phone assistance to help you set up and start using your server. As well as on-site service options to keep it running at peak performance for a lifetime.

For more information and the name of your authorized Apple reseller, call 1-800-776-2333.

With Apple Workgroup Servers, it's never been easier to give people the power to work together. With the power you expect from Apple. The power to be your best.® Apple

hard drive start as low as $2949 and $5489, respectively. Both systems include System 7.1 and AppleShare 4.0 pre-installed and built-in Ethernet support. Keyboard, display and appropriate Ethernet transceiver sold separately.
were AppleShare, Banyan VINES, Novell NetWare, IBM LAN Manager and Microsoft LAN Server.
mark of UNIX System Laboratories, Inc.

Reviews

Aldus PageMaker 5.0

Desktop Publishing Software

PROS: Many significant new features; color separation requires no separate program; straightforward operating style; excellent cross-platform compatibility; good documentation and support. **CONS:** Devours memory and disk space; Aldus Additions technology has some interface quirks; can't change line or box widths or patterns using Control palette; no Group command; Print dialog box provides limited access to printer-specific features. **COMPANY:** Aldus Corporation (206/622-5500). **LIST PRICE:** $895.

MW ★★★★

ROBERT PERRY

AFTER SEVERAL YEARS OF SEEING ITS market share eroded by QuarkXPress, Aldus finally saw the typesetting on the wall and launched a major effort to reverse the trend. PageMaker 5.0 provides those features, great and small, with which QuarkXPress zealots used to taunt PageMaker loyalists. PageMaker 5.0 not only matches QuarkXPress's best features, it also improves on many of them.

Best of all, Aldus retained the ease-of-use advantages that PageMaker has had from the start. The result is a program that belongs on any DTP professional's shortlist, and it may even win some converts from the Quark camp.

Better Late Than Never

Many of PageMaker 5.0's new features fall into the "finally!" category. You can now open more than one document at a time—earlier versions' one-at-a-time limitation was archaic and inconvenient. Like QuarkXPress, PageMaker 5.0 lets you drag text or graphic elements from one open document window to another—no cutting and pasting needed to reuse last month's masthead in your newsletter. You can now quickly arrange multiple open windows to avoid screen clutter.

PageMaker now has a library palette so you can store and recall often-used elements. As in QuarkXPress, you can assign keywords to elements in the library. PageMaker 5.0 also lets you add descriptive information for library entries, including author name and creation date. Libraries can also store linked text blocks, such as those in a multicolumn news story—QuarkXPress libraries can't. And if you use the Aldus Fetch multimedia database, you can import text and graphics from Fetch databases into PageMaker libraries.

Aldus's past attitude to creating special effects seemed to be, "Let 'em use FreeHand and then import the effects." Many graphics professionals turned to QuarkXPress instead. To counter this trend, Aldus has added numerous text and graphics effects to PageMaker.

Look carefully and you'll see that a rotation tool replaces the Toolbox's rounded-rectangle tool. Previously PageMaker could rotate text in 90-degree increments only, and couldn't rotate graphics at all. In PageMaker 5.0, you can rotate elements in increments as small as .01 degree—either by using the mouse or by typing values in the new Control palette.

The Control palette debuted in version 4.2, but 5.0's is far more powerful. Among other things, it now gives you more control over text- and paragraph-formatting—you'll spend less time using the Type menu for changing fonts and styles and adjusting kerning and tracking.

You also get access to more text and graphics attributes than are in QuarkXPress's measurements palette. Quark's palette doesn't let you summon or create paragraph style sheets—PageMaker's does. But PageMaker's Control palette doesn't let you change the width and style of boxes and lines; Quark's does.

PageMaker's Control palette offers several new features for skewing and flipping text or graphics. Skewing creates an element with diagonal rather than vertical edges. Flipping lets you reflect text or graphics (as though the element were reflected in a mirror) or turn it upside down.

Lots of Additions

I'm among the minority of electronic publishers who believe that PageMaker's typographic output has long been superior to QuarkXPress's—not because of more type-finessing features, but for some rather esoteric reasons. PageMaker uses a hyphenation dictionary, for instance, while QuarkXPress relies on rules that English grammar loves to break. PageMaker's justification scheme more closely follows the rules of traditional typography, which say that interword spacing should be adjusted before intercharacter spacing. And PageMaker has for years provided true typographic tracking; QuarkXPress's Tracking command provides range kerning, which lets you adjust intercharacter spacing over a range of text. Now, fine-tuned tracking tables provide better results. And a new included addition (Aldus-speak for an add-in utility) enables you to edit the program's existing tracks or create new ones.

PageMaker 5.0 includes Agfa's KernEdit utility, which lets you edit and create your own kerning data. QuarkXPress lets you do that, too, but the resulting kerning tables can be used only with QuarkXPress. KernEdit's kerning tables also work with programs such as Adobe Illustrator and Aldus FreeHand. This provides consistent kerning across programs—a hallmark of fine typography.

Yet another new addition, Expert Kerning, kerns a selected range of text by inserting manual kerning codes based on the kerning data built into a font. Although there's no substitute for hand kerning, especially for large headlines, the addition works remarkably well.

Along with the kerning-related additions, PageMaker 5.0 includes new additions that let you create booklets, save and recall printer settings, automatically insert bullets or numbers at the beginnings of paragraphs, and scan images directly into PageMaker publications.

More third-party developers now offer additions, too, although the selection is small compared with that of Quark XTensions. More important, the Aldus Additions technology has some limitations that can cause confusion. All additions appear in one place—the Additions submenu of the Utilities menu. Quark puts extensions in the most appropriate menu.

Another problem with the Additions mechanism is that an addition is always available, even when it wouldn't make sense to choose it. (You can, for instance, choose the Drop Caps addition when a graphic is selected.) This contradicts Apple's guidelines, and it means an annoying error message each time you choose an addition under the wrong circumstances.

Coloring and Printing

PageMaker 5.0 provides several new features for working with spot color as well as color images. The program supports a larger number of color-specification systems than its predecessor. Several variants of the Pantone library are now included, as are libraries for Focoltone, Trumatch, Dainippon, and Toyo. You can also create custom color libraries—a feature QuarkXPress doesn't provide.

PageMaker can now create process-color separations at printing time. Aldus PrePrint, the color-sep utility shipped with PageMaker 4.2, is no longer included, although it's still available and is necessary for advanced prepress tasks such as adjusting dot gain and fine-tuning continuous-tone color images.

PageMaker 5.0 finally does away with Aldus Prep, the system file previously used for printing to PostScript printers. The new PageMaker includes LaserWriter 8.0, the new, Level 2–aware PostScript printer driver created by Apple and Adobe. Besides enabling background printing (a long-overdue feature), the new driver allows PageMaker to retain its "magic-stretch" graphics-resizing feature. Magic stretch makes it easy to resize bitmapped graphics, such as scanned images, so that they print without distortion.

Although PageMaker requires the new driver, it doesn't take advantage of one of its biggest conveniences—the ability to control printer features such as resolution enhancement from the Print dialog box. Aldus claims there wasn't time to support this aspect of the driver—hard to believe, given the driver's multiyear gestation period. Aldus may add this support if enough customers bark.

Bridging the Mac-Windows Gap

Aldus has more experience creating dual-platform programs than any other company, including Microsoft: PageMaker has been available for Macs and DOS PCs since 1987. With version 5.0, Aldus has provided identical features and file formats (Windows PageMaker 4.0 lacked some of the features of Mac PageMaker 4.2). The Mac and Windows versions of PageMaker 5.0 can swap publications, even offering to convert fonts not present on one platform. Both versions also automatically convert platform-specific graphics formats such as the Mac's PICT format and Windows' metafile format (equivalent to PICT).

PageMaker 5.0 is the first non-Microsoft program to support Microsoft's object linking and embedding (OLE) data-exchange system. Like the Mac's publish-and-subscribe system, OLE lets you establish hot links between programs: change an Excel spreadsheet that's linked to a publication, and the publication changes accordingly. PageMaker 5.0 even maintains links when a publication moves from the Mac to Windows, or vice versa.

Clear Out Your Hard Disk

PageMaker 5.0 has put on weight. It uses between 6MB and 15MB of hard disk space (depending on the options you install) and requires at least 5MB of RAM (8MB is more reasonable). QuarkXPress 3.2 isn't nearly as portly.

But PageMaker 5.0 trails QuarkXPress in some areas. It still lacks a Group command for treating multiple objects as a single one. (A pseudogrouping addition is included, but it's an awkward solution.) PageMake is also less suited to automating the production process; changing a layout from, say, four columns to three still requires manual labor.

In all, however, PageMaker 5.0 is a superb upgrade. If you own a previous version, drop this magazine now and order the upgrade. When it arrives, note two points before converting your PageMaker 4.2 publications. First, PageMaker 5.0's tweaked kerning tracks are likely to cause tracked text to reflow. (You can use PageMaker 4.2's tracks by following the instructions in one of 5.0's Read Me files.) Second, Aldus had at press time begun receiving complaints about links to some encapsulated PostScript files not being retained during conversion. The workaround: use the Links dialog box to relink the affected EPS file, or reimport the file using the Place command.

If you use QuarkXPress, should you switch? If you've built a production environment around QuarkXPress and you aren't fed up with Quark's mixed track record for customer support, probably not. But if you've been using Quark because it has always provided more features but you find the program a bit unwieldy, consider making the switch.

If you're just starting to take the electronic-publishing plunge and don't anticipate needing the highly specialized extensions that have been developed for QuarkXPress, consider PageMaker first. It has always been the most approachable publishing program. Now it's among the most powerful, too.—JIM HEID

Adobe Illustrator 5.0

Draw Program

PROS: Multiple undos; edit in preview mode; custom page sizes; excellent gradient creation and application controls; flexible drawing layers; plug-in modules afford enormous range of new creation and manipulation capabilities. **CONS:** Still can't import TIFF images; plug-in modules are not organized according to function; insufficient control over templates. **COMPANY:** Adobe Systems (415/961-4400). **LIST PRICE:** $595.

MW ★★★★

PROFESSIONAL ARTISTS TAKE FOR granted the rivalry between Adobe Illustrator and Aldus FreeHand. While Illustrator has, in my opinion, maintained an edge over FreeHand in recent years, it clearly lacked significant functions that FreeHand provided—foremost among them layers, automated gradations, multiple undos, support for TIFF images, and an editable preview mode. The result is that most of us purchased both programs. I have long hoped one of these programs—I don't care which—would blow the other one out of the water so that I and other artists could settle on a single program and save a few hundred bucks.

Illustrator 5.0 (so numbered because it goes beyond the capabilities of Illustrator 4.0 for Windows) addresses all but one of its predecessor's deficiencies—strangely, it still can't import TIFF images—and adds enough new features to boggle the mind. It even has a few capabilities from Deneba's Canvas, a savvy acknowledgment of the popularity of the midrange graphics package.

Playing Catch-up

Many of Illustrator 5.0's enhancements can be dismissed as pure catch-up functions. For example, FreeHand 1.0 lets you undo multiple operations, draw and edit objects in the preview mode, and create custom page sizes. Six years later, Adobe has included these features in Illustrator 5.0. It's about time.

Other Illustrator catch-up functions go beyond the expected. The automated gradations, for example, thoroughly trounce those provided by FreeHand. Whereas a gradation in FreeHand is limited to two key colors—one at the beginning and one at the end—Illustrator permits as many as 32 key colors per gradation. You can also set the position of the midpoint between key colors to create accelerating and decelerating blends, impossible in FreeHand. You can even drag with a Photoshop-like gradient-fill tool to specify the orientation of a gradation inside a selected shape and position the hot spot of a radial fill independently of the gradation's center, a function utterly unique to Illustrator.

Illustrator 5.0 may be the last object-oriented program on earth to introduce independent drawing layers, but the quality and flexibility of its controls make the program special. Like most programs, Illustrator lets you hide and lock layers by clicking inside the floating Layers palette. But Illustrator lets you assign each layer its own color. When you select one or more objects, Illustrator colors the points and segments in the objects with the colors of the layers on which the objects sit. There's no guesswork; you immediately know which objects go with which layers. Moving objects between layers has also been simplified. A small square next to a layer name in the Layers palette represents all selected objects on that layer. To move the objects to a different layer, just drag the square. What could be easier?

Like Photoshop, Canvas, QuarkXPress, and others, Illustrator supports plug-in modules. As in Photoshop, plug-ins manifest themselves as commands in the Filter menu. But while this makes sense in Photoshop because all filters change an image in prescribed increments, Illustrator's plug-in modules run the gamut, enabling you to create shapes; manipulate objects; search and replace text characters; and perform other, equally unrelated operations.

Perhaps most exciting is the Pathfinder module, which lets you merge objects to create complex paths, much like the Combine commands in Canvas and Aldus IntelliDraw. To create a crescent, for example, you use one circle to take a bite out of another. You can combine two objects into a single outline, use one path to crop another (similar to masking), or fill the area where two objects overlap with an intermediate color so the front object appears translucent. The downside is that it requires a math coprocessor (FPU), which rules out many LC, IIsi, and Centris 610 users.

Other modules—none of which require an FPU—let you draw stars and regular polygons, select objects according to stroke and fill, assign arrowheads to a line (another sorely needed function), clean up stray points, smooth out or rough up the perimeter of a path, double the amount of points in a path, and convert the boundaries of a stroke to paths. You can align objects, a staple of absolutely every draw program (except Illustrator) since MacDraw 1.0.

Not everything in Illustrator is hunky-dory, however. Unlike every other object-oriented program, Illustrator can only import images saved in the inefficient EPS format; there's no support for TIFF, PICT, or JPEG. You still have no control over the placement of background templates, which invariably display as black and white. You still can't scale a shape by dragging on its corner handle, a nearly universal operation among graphics programs. Illustrator 5.0 lacks a Revert command, so you have to close a document, decline to save it, and reopen it if you make a mistake. And there's no automatic trapping option as in FreeHand, though the documentation devotes several pages to manual trapping techniques.

Most of these problems are minor. Illustrator has always been the most dependable draw program on the Mac. Now it's also the most powerful. The next version of FreeHand has its work cut out for it.—DEKE McCLELLAND

DANE SPANGLER AND TOM MIDGLEY, BLUE FIRE DESIGN

Divide and Conquer This drawing is largely the product of Illustrator 5.0's plug-in modules. The sun was created by drawing several circles and applying the Roughen filter at 2 percent. The Pathfinder module was used to cut circular arcs out of the "walls" on the left and right sides. Gradient fills adorn most objects.

QuarkXPress 3.2

Desktop Publishing

PROS: High degree of control over layout elements and typography; color-matching capabilities; automatic save and backup. **CONS:** Some ease-of-use quirks; uneven customer service. **COMPANY:** Quark (303/894-8888). **LIST PRICE:** $895.

MW ★★★★

COLOR MATCHING HAS LONG BEEN an Achilles' heel in desktop publishing—what you see or scan is usually not what you get when your publication comes off the press. By teaming up with Electronics for Imaging, Quark has addressed this critical need of color publishers. QuarkXPress 3.2 includes the EfiColor XTension, which uses EFI's color profiles (used also in the EfiColor for Photoshop plug-in and in EFI's Cachet color-matching software for scanned images) to ensure the greatest fidelity of color images from scan or online creation to final print. It's a must-have for professional color publishers. For QuarkXPress users publishing in black and white, version 3.2 offers less incentive to upgrade, since its other enhancements are minor, even if welcome.

EfiColor is invisible much of the time you use QuarkXPress, so it is easy to underestimate its value. You typically see EfiColor only when you import files (when you select a file to import, the dialog box shows what profile EfiColor applies to the image) and when you define colors (EfiColor alerts you if a color falls outside the target printer's range).

EfiColor works by applying profiles—essentially, electronic color filters—to an image in two stages: when you import a file and when you print. In the EfiColor Preferences dialog box, you specify, for example, that your scanned RGB images come from a Hewlett-Packard ScanJet IIc and your computer-generated images were created using SuperMac Technology's SuperMatch 20 T monitor. Unless you specify otherwise during import, your RGB files will have these profiles applied. In the same dialog box, you specify the output device, such as SWOP-coated (standard web offset-printing press using coated paper, such as that used in *Macworld*), so EfiColor can apply the appropriate profile to both RGB and CMYK images at output.

EfiColor works well for RGB images. But it is less successful with CMYK images, since it assumes the color has already been calibrated. That's not a safe assumption—an RGB image created in Photoshop and converted to CMYK in Photoshop is still affected by the monitor's color characteristics, so what you see on screen may not match the output. (Use the $199 EfiColor for Photoshop plug-in if you work with CMYK TIFF files in Photoshop.) Worse, EfiColor does not work at all with EPS files, whether CMYK or RGB. And if the bundled profiles don't cover your hardware, you'll have to buy them from EFI ($129 to $529 each; 415/286-8600).

Color Alert With the EfiColor XTension, QuarkXPress can warn you if a color you define falls outside the target printer's capabilities, as it does here. (The area inside the red line shows the color range the printer can handle; the triangle icon near the New color swatch at left indicates the new color is unreproducible.)

In noncolor areas, the new version of QuarkXPress represents a continuing refinement of the program. For example, you can now set QuarkXPress to keep a backup copy of your document. You can also have it save a user-specified number of prior versions, so you can go back to a previous design if you take a wrong turn on your design path.

One of my favorite enhancements is the smart-quotes feature, which converts the keyboard's straight quotes (") to open and close typographic quotes (" ") as you type. It even works when you're replacing text. Plus you can choose quote characters from several languages, not just English. My other favorite feature is the ability to use mathematical expressions in dialog boxes. For example, if a picture box's width is 22p7 and you want to double it, you can change it to 22p7*2 rather than calculating to get 45p2 and entering that number. Likewise, you could halve the width by changing it to 22p7/2.

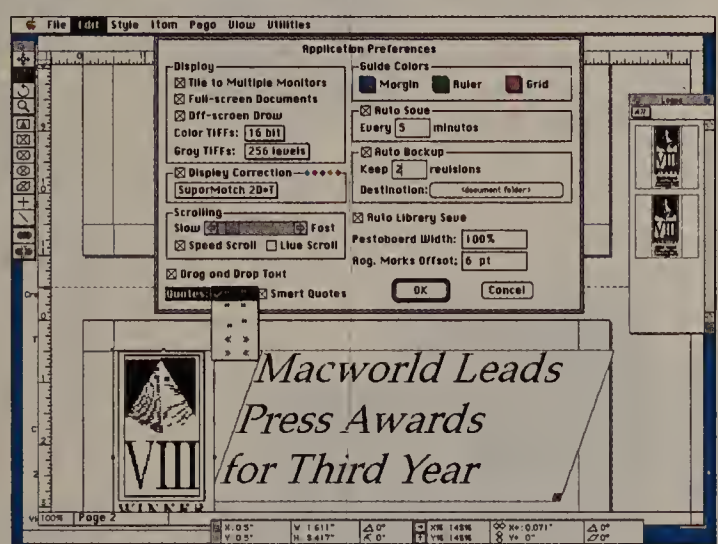
Other welcome changes are the ability to skew text and picture boxes (and their contents), specify the style to be applied to text in a subsequent paragraph, size text with the mouse, and choose between tiled and stacked windows when you have multiple documents open. The bundled Font Creator XTension lets you create variations of multiple-master PostScript typefaces, while the bundled Cool Blends XTension lets you apply nonlinear blends (such as diamonds) to box backgrounds (but if you share files with others, they'll need this XTension to open any document using its effects).

Not all changes are so nice. Selecting the New option in the File menu now displays a submenu that requires a choice of Document or Library. Quark has elevated the status of libraries by letting you open them with the standard Open dialog box (they're no longer buried in the Utilities menu), but this adds a step to creating a new document.

The Document Layout palette has also changed, as has how you apply master pages in it. This has always been an awkward process; the change in version 3.2 is meant to simplify master-page application, but it drew mixed reactions among *Macworld* editors.

Current users of QuarkXPress will like most of the changes in version 3.2. New users will appreciate the fine control the program has long offered over layout and typography. All users will continue to be frustrated by Quark's cavalier attitude toward customer support (technical support itself is usually decent, but it's common for customers to be frustrated when seeking program updates, replacements, drivers, or other such help), which is a shame, considering QuarkXPress users' often-fierce loyalty.

—GALEN GRUMAN



Custom Controls Among QuarkXPress's new preference settings (top) are drag-and-drop text, smart quotes (with a choice of quotation marks for different languages), and automatic save and backup. You can now also skew text boxes (bottom).

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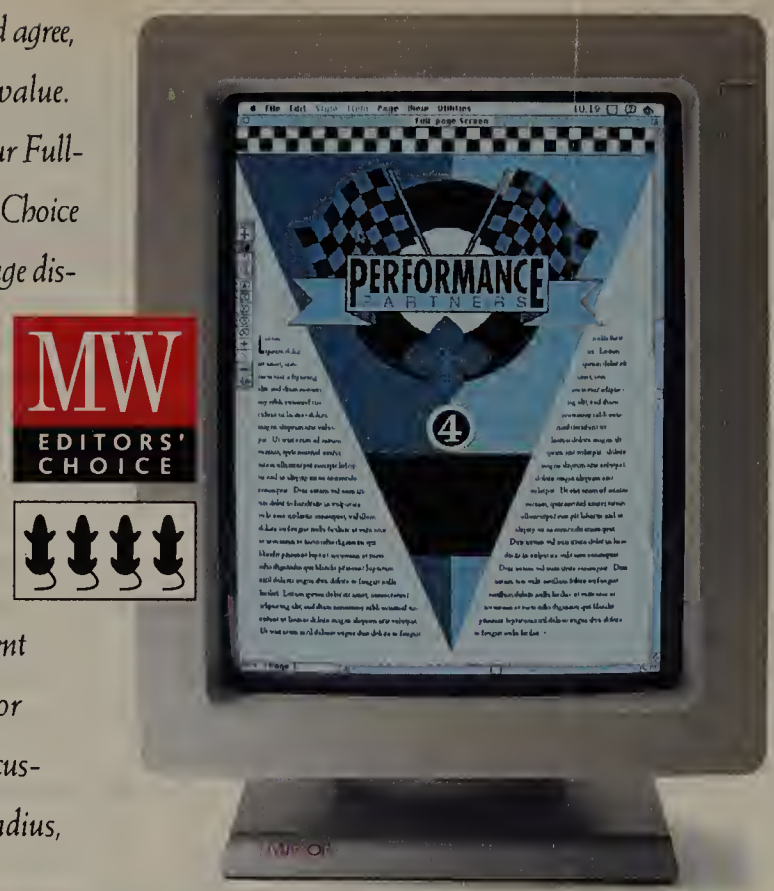

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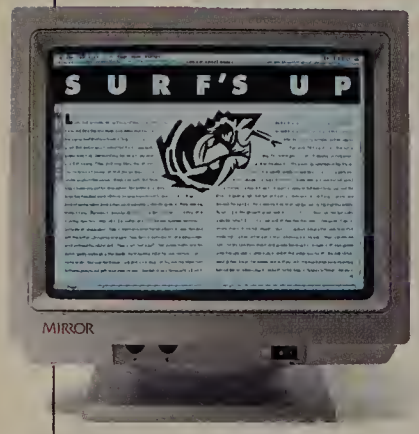

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Symantec C++ for Macintosh 6.0

Software Development System

PROS: Includes Think C 6.0, Think Reference, and SourceServer; supports third-party editors, AppleScript, and Frontier scripting for production efficiency. **CONS:** MPW compiler sold separately. **COMPANY:** Symantec Corporation (408/253-9600). **LIST PRICE:** $499.

MW ★★★★

THE MACINTOSH WORLD HAS NEEDed this product for several years. The C++ language has been the emerging development standard on most other computer platforms, and while Apple's MPW (Macintosh Programmer's Workshop) version of CFront (a preprocessor that translates C++ code to C code for compilation) has been available, it's sluggish compared with the speed demon Symantec has now produced. If you like Think C, and plenty of developers do, you'll like C++ 6.0, too.

The $499 package includes Think C 6.0 as well as C++, the now-familiar Think Class Library, and Think Reference 2.0, but not the MPW version of the compiler. The MPW product can compile MacApp-based programs as an MPW tool—please note that C++ 6.0 in the Think environment is not MacApp-ready (or MacApp is not C++ 6.0–ready yet). This situation is part of the transition Symantec is attempting to make with Think C. C++ is intrinsically a large-project language, and MPW has traditionally been the large-project, large-team development environment for the Macintosh. Think C, in contrast, has been a favorite on smaller projects with individual programmers or very small teams. By combining a native-code Think C++ compiler (not a translator) with SourceServer, and opening the product to third-party editors, Symantec has groomed the Think development environment to be the eventual successor to MPW. Organizations with large investments in MPW code and training may not find C++ 6.0 sufficiently compelling to induce them to switch environments just yet, but there is a trend—an Apple-supported trend for both Macs and PowerPCs.

The Works

The Symantec C++ 6.0 language definition is essentially that described in *The Annotated C++ Reference Manual* (M. A. Ellis, B. Stoustrup; Addison-Wesley, 1990), the current ANSI standard. What it means is that C++ 6.0 is not a partial implementation—multiple inheritance, nested classes, and templates are all supported, with real practical benefits. Nested classes, for example, make it possible to design large programs with just hundreds instead of thousands of global names. Templates are also useful for cleaning up code, since you can make a single class definition for a template and not maintain a separate class definition for each variable type. Multiple inheritance similarly lets you produce interesting new objects from a smaller original set of classes. If you have ever leafed through books on object-oriented programming and wondered exactly how this was making anyone's development tasks easier, please be assured that Symantec C++ 6.0 at least provides the tools to develop projects with less code instead of more.

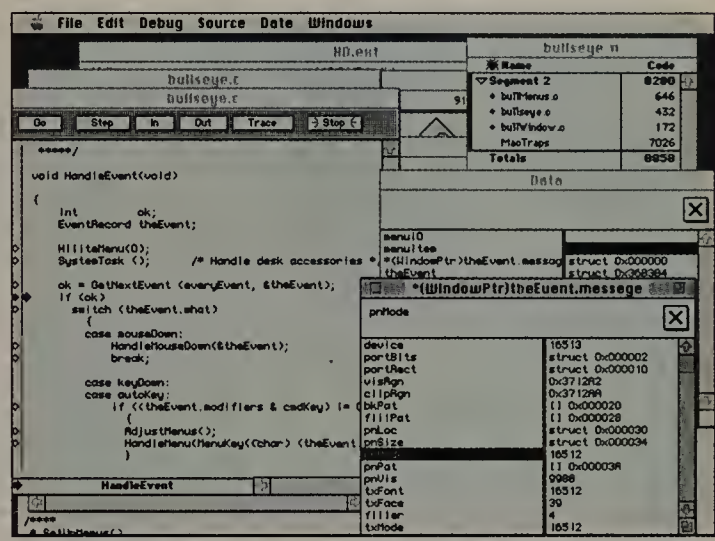
The integrated development environment was always a strong point in the Think languages, and this tradition has been extended. Think C's Project Manager still offers fast and convenient compile/link cycles; but by integrating Apple's SourceServer, C++ now also accommodates larger programming teams. SourceServer lets an administrator formulate a library of code pieces; SourceServer keeps an audit trail as programming-team members check out and modify parts of the program. C++'s Debugger has been updated for C++ (see "Digging for Data"). While it's still not comparable to The Debugger & MacNosy ($350; Jasik Designs, 415/322-1386), C++'s debugger is impressive for a bundled product. Recognizing that the Think editor has been adequate but not breathtaking, Symantec has opened C++ to accept other code editors, a move that will please devotees of ACI US's Object Master ($395; 408/252-4444), a favorite among serious developers.

But the main environment extension is scripting. You can execute MPW scripts within the Think environment and use AppleScripts to modify the environment itself, and UserLand has been actively promoting Frontier scripting as a way to automate large-project chores (library building, file cleanup, and updating) through the project manager. An open scripting environment like Think's becomes almost self-fixing; if there are aspects of the Project Manager or SourceServer you don't like, you can script your way around them or script your own alternative versions. This approach isn't free (UserLand's Frontier costs $249, and the AppleScript Developer's Toolkit from APDA is $199), but either scripting solution will easily pay for itself on a large programming project.

A– for C++

Developers have generally been pleased with this C++, especially in compiler speed and code quality. Version 6.01 (we tested a beta version, the shipping version should be ready by the time you read this) fixes a number of numerical bugs and compiler/library incompatibilities—it's fair to say that Symantec had a lot fewer of these than would normally be expected for a new compiler of this complexity. Also, while C++ has attracted developers because of its power, it's one of the most difficult programming systems to master. (Symantec's documentation is thorough, but it's no place to start.) Your best hope for using this product as a beginner is to get a copy of Dave Mark's *Learn C++ for the Macintosh* (Addison-Wesley, 1993) and read it cover to cover—the patient explanation of object-oriented development is enlightening even for experienced programmers.

Surveys show that about 90 percent of commercial programs are written in C, but that 75 percent of developers want to modernize their works in C++ as soon as appropriate tools are available. For the Macintosh, Symantec C++ 6.0 is an excellent opportunity to catch the new wave.
—CHARLES SEITER



Digging for Data The Think C++ Debugger, while not the absolute last word in the debugging art, nonetheless offers plenty of useful features, such as this Data Window for watching the individual components of complex data structures.

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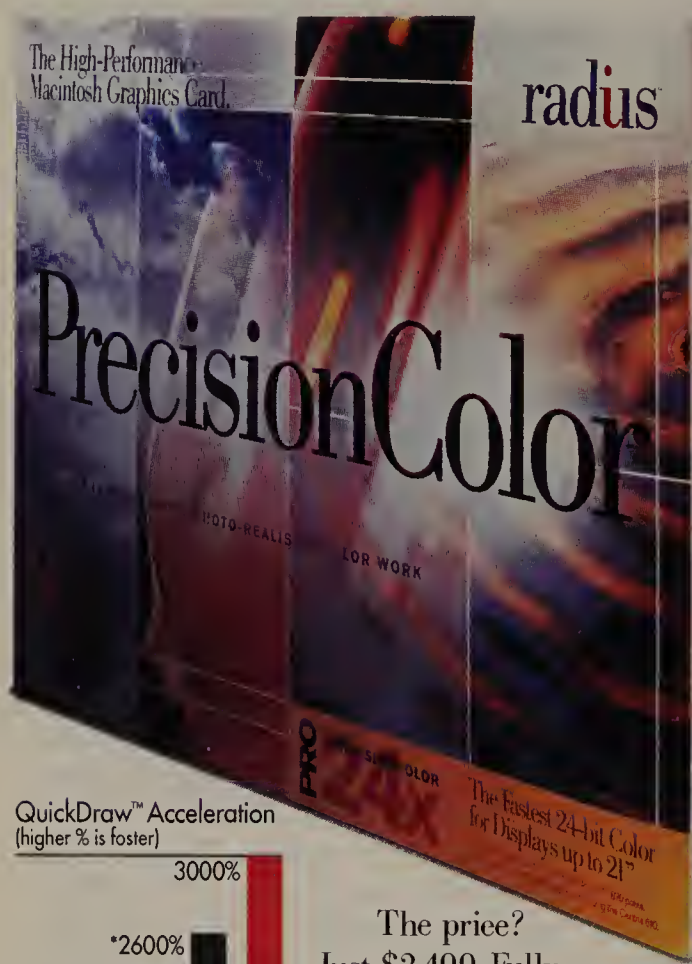

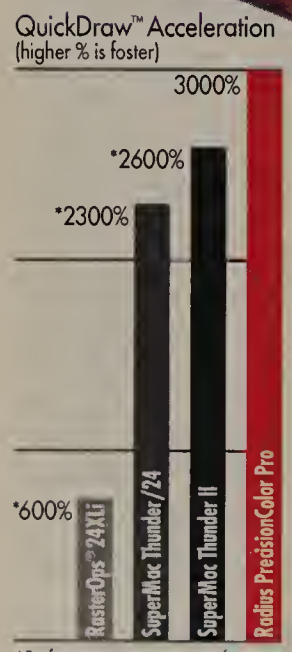

*Performance percentages from publications by RasterOps Corp. and SuperMac Technology, Inc.

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Editing Aces Suite

Video-Editing Hardware

PROS: Supports input and output of 16-bit, stereo, CD-quality sound; plays back full-screen QuickTime movies smoothly; offers video color-correction. **CONS:** Requires separate NTSC monitor; sound problems at moderate to low sampling rates; buggy QuickTime editing functions; limited to 320-by-240-pixel resolution. **COMPANY:** RasterOps (801/785-5750). **LIST PRICE:** $3899; separately: MoviePak $999, MediaTime $1999, Video Expander II $699.

MW ★★★

THE EDITING ACES SUITE IS A COLlection of RasterOps products that enables video professionals and extremely serious (or rich) QuickTime enthusiasts to record and play back full-screen movies in 24-bit color with 16-bit CD-quality sound. To achieve this feat, RasterOps combined the recent MoviePak daughterboard with two existing products—MediaTime and Video Expander II. This approach is both confusing and flexible—confusing because it requires three installations described in three separate manuals to assemble the Suite, and flexible because users can upgrade their equipment by purchasing an individual Editing Aces component.

QuickTime Erector Set

The primary operators in the Editing Aces Suite are the MediaTime board and breakout box, which serve two functions. First, the board acts as a 24-bit video card capable of driving a standard 13-inch monitor. Second, the board and box combine to address composite video input and stereo-audio input and output. Four RCA jacks on the breakout box handle the line-level audio functions, while two jacks, one RCA and one S-Video, permit a single video-input signal. By itself, the MediaTime board lets you record QuickTime movies from a high-resolution source complete with 16-bit stereo sound.

The MoviePak daughterboard attaches to the MediaTime board. You can also attach the MoviePak to three of RasterOps' other multimedia boards, including the 24STV, 24MxTV, and 24XLTV. Although the MoviePak provides no additional input or output capabilities of its own, it dramatically boosts the MediaTime's video potential by adding both JPEG and proprietary hardware compression and decompression capabilities. You can record 320-by-240-pixel movies (one-fourth of a standard 13-inch screen) at rates as high as 30 frames per second, assuming sufficiently speedy equipment. (The highest I achieved on my IIci was 25 fps.) According to RasterOps, the algorithms can accommodate compression ratios from 2:1 to 160:1. The MediaGrabber 2.2 software bundled with Editing Aces exploits the MoviePak's ability to expand and accelerate the playback of QuickTime movies. You can blow up quarter-screen movies to full-screen resolution (640 by 480 pixels) and play them smoothly—without the usual hitches and sound gaps—at the full rate at which they were recorded.

The Video Expander II encoder box, connected to the MediaTime's video-output port in lieu of a 13-inch monitor, converts the 24-bit RGB signal to interlaced NTSC. You can attach multiple video-recording decks, television monitors, and other NTSC devices to the Expander's BNC, RCA, and S-Video output jacks. The Expander even offers video input for genlocking, color phasing, and other high-end options that require a separate video mixer.

The fourth ingredient is not included. Because the Video Expander converts the MediaTime board's only RGB output signal to an NTSC signal, you need a monitor that supports interlaced video, such as the Sony 1302 (RasterOps' suggestion) or a standard television monitor. To view menus, icons, and other bits of the Mac interface, you must hook the RGB monitor to either your Mac's onboard video port or a separate video board. This two-monitor solution requires additional setup costs (unless you already have an extra TV monitor) and a sacrifice of desk space. By contrast, SuperMac Technology's DigitalFilm board lets you attach an RGB monitor and an NTSC recording device and switch between the two, a more elegant solution.

You can use Editing Aces with Macromedia's Mediamaker 1.5 to create live video-overlay effects. You can also record digital movies directly from QuickTime applications such as Adobe Premiere (bundled with Editing Aces). But the MediaGrabber software, designed for Editing Aces, has the widest range of recording options and the best method for outputting QuickTime movies via the Video Expander box. MediaGrabber provides color-enhancement options for correcting or altering video images. You can even apply effects when working with live video if you're willing to put up with some degradation in frame rate.

MediaGrabber can capture still images at full 640-by-480-pixel resolution, sample sounds, and record QuickTime movies. Its sound capabilities are generally excellent. You can capture 16-bit stereo sound at a 44.1kHz sampling rate, equivalent to CD sound. The software can also play the sound in full stereo through the breakout box. By the time you read this, Editing Aces will ship with Apple's Sound Manager 3.0, which will feature redirectable sound output so you can play sound tracks from QuickTime movies through the breakout box as well. Without Sound Manager, QuickTime sound emanates exclusively from the Mac speaker. I did encounter one consistent problem, however. When sampling QuickTime sound tracks at rates of 22.3kHz and lower, the sound broke up, the tempo quickened, and there were static pops and clicks. By raising the sampling rate to 37.8kHz, I eliminated this problem entirely.

MediaGrabber provides basic clipboard editing functions, but they leave a lot to be desired. The cut, copy, and paste functions are problematic and sometimes buggy. You can select only general ranges of frames in the movie. For example, in a three-minute movie, you can select only in one-second increments. The Paste command sometimes doesn't work directly after cutting or copying frames. And worst of all, if you open a movie on disk, make edits that you later decide you don't like, then close the movie without saving it, MediaGrabber erases the file on disk.

For sound, there's no disputing that the Editing Aces Suite delivers professional-quality results, among the best—if not the best—of any video-editing package available. But for video, its 320-by-240-pixel QuickTime format results in very grainy images, suitable only for proofing. While likewise short of professional quality, DigitalFilm's 640-by-240-pixel resolution is preferable. (On videotape, a sacrifice in vertical resolution is less noticeable than one in horizontal resolution because of the way the interlaced signal draws even and odd fields.) And DigitalFilm handles up to a 20-inch video display; the MediaTime tops out at a 13-inch screen. RasterOps also needs to improve the performance of its MediaGrabber software and, in my opinion, accommodate an RGB monitor even when recording via the Video Expander box. However, these complaints are minor. Despite its flaws, the Editing Aces Suite records and plays QuickTime movies quickly and reliably. It represents a praiseworthy step forward in QuickTime technology.—DEKE McCLELLAND

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Poor Claris. Once again, Canvas™ is running circles around MacDraw® Pro. In fact, they are still trying to catch up to Canvas 3 while we've added dozens of new features and enhancements to create Canvas 3.5. Like 3-D extrusions of text and graphics, enveloping of text and graphics, smart lines, fine kerning, fractals, automatic concentric circles and spirals, and a tool loader that allows you to add tools as you work. There's even a versatile pressure-sensitive freehand Bézier pen tool. And Canvas 3.5 has really outdone itself with new improvements including object blends, binding of text to shapes and curves, Beziér text conversions, and macro windows. Which is just the beginning, because Canvas also includes all the great features of 3.0 like custom parallel lines and curves, our unique SmartMouse™, and more. Comparing Canvas to the competition is like comparing a superbike to a tricycle. And only Canvas is self-upgrading, allowing you to add new tools, effects and file translators at will. Last but not least, while MacDraw Pro is idling somewhere back in the Dark Ages, Canvas features seamless file sharing with its recently released Windows version. Add it all up, and it's easy to see that it's time to shift gears to Canvas. For the ultimate in value and performance, Canvas gives you the ride of your life. So go ahead and hop on.

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Circle 57 on reader service card

Two Copy Programs

Copy Utilities

Copyright Pro 1.0.3

PROS: Can queue multiple jobs for copying; can set detail level of copy log; has filters to select files for scheduled copies. **CONS:** Does not speed up most copy jobs; can't trigger automatic copies at start-up or shutdown. **COMPANY:** CSG Technologies (412/471-7170). **LIST PRICE:** $79.

MW ★★★

CopyDoubler 2.0

PROS: Can queue multiple jobs for copying; speeds up most copy jobs; can automatically trigger copies at start-up or shutdown; speeds Trash emptying. **CONS:** Scheduled copies limited to quarter-hour intervals; no filters for selecting files for scheduled copies. **COMPANY:** Fifth Generation Systems (504/291-7221). **LIST PRICE:** $59.

MW ★★★★

YOU PROBABLY DON'T THINK MUCH about the mundane task of copying files—unless the files are huge, you've got a lot of them, and you find yourself staring at your Mac's desktop for a long, long time, waiting for the Finder to do its job. That's when a file-copying utility, such as Copyright Pro or CopyDoubler, suddenly becomes appealing.

Copyright Pro

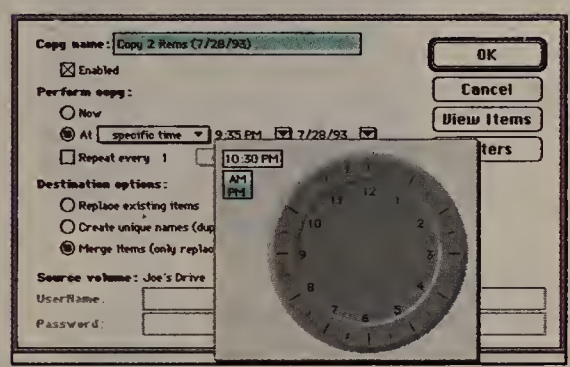
Copyright Pro is a beefed-up version of Copyright, CSG Technologies' $49 basic copy utility. Both speed up your work by taking over the Finder's copy function and handling copying tasks in the background. The Pro version adds a feature for scheduling copying to be performed at a preset time and at regular intervals.

Copyright Pro doesn't accelerate file copying; in fact, when making duplicate copies of files on a single hard drive, Copyright Pro lags behind the Finder in speed tests. But it does allow you to copy multiple files to different locations simultaneously, and that can be a real time-saver. If you start a new copy job while Copyright Pro is making a copy, the program simply adds the new job to its queue and plods through the copies one at a time in the background. When all the copying is done, Copyright Pro notifies you with a sound or a standard alert box. Of course, you *can* operate Copyright Pro in the foreground, in which case a status window indicates the number of items remaining to be copied.

When copying to floppy disks, Copyright Pro gives you the option of making copies with verification. (The Finder always verifies copies to a floppy.) When you disable the verification feature, Copyright speeds through the copying twice as fast as the Finder—but unverified copies are not as reliable as verified ones.

Copyright Pro's scheduling features are among its best. To schedule a copy job to take place at a specific time, you hold down the control key while dragging the files you want copied to a destination disk. A dialog box appears in which you set the precise time and date you want the copying to be performed. Better still, you can use Copyright Pro's filters to determine exactly which files will be copied each time a scheduled copy is triggered. For example, you can set up a scheduled copy job in which only Microsoft Excel documents that have the word *budget* in their names will be copied.

Copyright Pro can also keep a history of all copying on your Mac, even copying done by the Finder. You can set the detail level of the copy log to show the names of all files copied, or just folder names. The history can record the copying of documents, applications, or all files.



Watching the Clock Setting up a scheduled copy is easy with Copyright Pro; drag the arm on the clock to the time you want the copy performed. Once you've picked a time and date, you can set Copyright to repeat the copy job at any interval.

CopyDoubler

Like Copyright Pro, CopyDoubler replaces the Finder's copy function and allows you to queue jobs for background copying, so you can immediately launch and use other applications. But CopyDoubler also accelerates copying. And it provides several features completely missing in Copyright Pro.

For example, CopyDoubler can verify copies made to network disks, removables, and hard drives—not just floppy disks. It can copy the comments contained in a file's Get Info box. And its sound-alert features outshine Copyright Pro's: you can choose not one sound, but three—one to indicate that a new job has been added to the copy queue, another to indicate a problem or error, and a third to indicate the completion of all copies.

And unlike Copyright Pro, CopyDoubler actually outperforms the Finder on most copy jobs. Fifth Generation promises speed gains of up to 500 percent, but I saw copy speeds double at best.

As with Copyright Pro, you schedule a copy with CopyDoubler by holding down the control key when drag-copying. In some ways, CopyDoubler's scheduling options are more limited than Copyright Pro's—the schedule must be set at quarter-hour intervals, and there are no filters for selecting specific types of files for copying. On the other hand, CopyDoubler has a few options lacking in Copyright Pro. You can, for example, set CopyDoubler to trigger a copying job whenever you shut down or start up your Mac—a great feature if you use the program to do basic backup. CopyDoubler also allows you to define a key combination to trigger a scheduled copy.

If run in the foreground, CopyDoubler displays a status window with detailed information on each copy job, showing a rough estimate of time remaining on each job (one big job estimated at 32 minutes actually took 25), the number of kilobytes per second being copied, how much data has been read into memory, and how much data still needs to be written and verified. CopyDoubler records all copy activity and stores the log as a text file in the System Folder.

CopyDoubler also includes a Fast Trash feature, which, in my tests, speeds file deletion by about 30 percent when you empty the Trash. There's also a Security Erase feature, which overwrites erased files so they can't be recovered by file-recovery programs. Finally, if you use Fifth Generation's AutoDoubler, you can set CopyDoubler to automatically expand compressed files when copying.

At press time Fifth Generation released a 2.0.1 upgrade to CopyDoubler to fix several minor bugs and one potentially serious bug (attempting to drag-copy one blank floppy to another floppy could result in damaging files on your hard drive). The upgrade is free and available on online services.

While CopyDoubler doesn't include some of Copyright Pro's best scheduling features, CopyDoubler's other attributes more than make up for the deficiency. Overall, it offers better copying at a lower price.—JOSEPH SCHORR

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Quicken 4

Personal Finance Software

PROS: New investment-tracking, loan-amortization, graphing, and financial-planning modules; easy to customize; excellent documentation; solves real problems. **CONS:** Slightly slower than previous versions. **COMPANY:** Intuit (415/898-6095). **LIST PRICE:** $69.95.

MW ★★★★

FOR MANY OF US, BALANCING CHECKbooks, paying bills, and figuring out household finances keeps getting more complex. Quicken 4 makes these chores easier, quicker, and better organized. And Quicken 4 does what I wish all software would do: it turns data into useful information.

Checking into Your Accounts

Quicken 4 provides accounts for tracking loan payments; credit cards; and investments, including mutual funds and portfolio accounts (plus Quicken offers a set of five financial calculators that help you calculate various savings and loan options). All the accounts are organized to work just like your checkbook, so the program feels familiar right away. But why should you bother to keep your books on the computer?

For starters, Quicken takes care of all the math—deposits, withdrawals, service charges, interest rates. You can also categorize each entry, specifying, say, whether a check was for groceries or medical expenses. Quicken gives you an easily customized, detailed category list. Plus, it memorizes what you type, so after the first time you type in your long-distance carrier, for example, Quicken fills in the entire entry after you've typed the first few letters, saving you keystrokes.

Transferring money between accounts—from one checking account to another, for example, or from checking to savings—is a breeze: just select the transfer source and destination account, specify the amount, and Quicken records the appropriate transaction in each. You can even select a group of regular transactions—such as monthly or quarterly bills, or automatic deposits and interest accrual—and have Quicken enter them automatically; alternatively, set the Billminder feature to pop up reminders when you start up the Mac or launch Quicken. You can even write checks (available from Intuit) within the program and print them on your printer.

The truly connected can use Quicken's optional CheckFree payment service to pay bills electronically (the first month is free, then $9.95 per month for 20 payments) and receive monthly credit statements via modem ($3) or on floppy disk ($4.50), as long as they use a Quicken Visa card (no annual fee).

Picturing Your Finances

If Quicken only made it easier to balance your checkbooks, it would solve a real household problem. The beauty is that the program just starts there. Once you've entered all of your checks and set up all your accounts, the program's graphing and reporting features actually give you insight on how you're spending your money. Quicken can generate reports for preparing income taxes, or export your data in .TXF format to compatible tax-preparation software packages.

Quicken creates four types of graphs: income and expense, budget variance, net worth, and investment performance. Each gives a useful visual summary of your finances. The income-and-expenses graph, for instance, shows you in all-too-clear detail what percentage of your income you're saving and where you're spending the rest (see "Where's It All Going?").

Quicken's 22 reports provide so much financial detail that you'll feel like the chairman of a Fortune 500 company. Your budget report, for example, breaks down actual versus budgeted spending for each month by both income and expense category, while the capital-gains report shows long-term and short-term capital gains for securities sold during a specified time period.

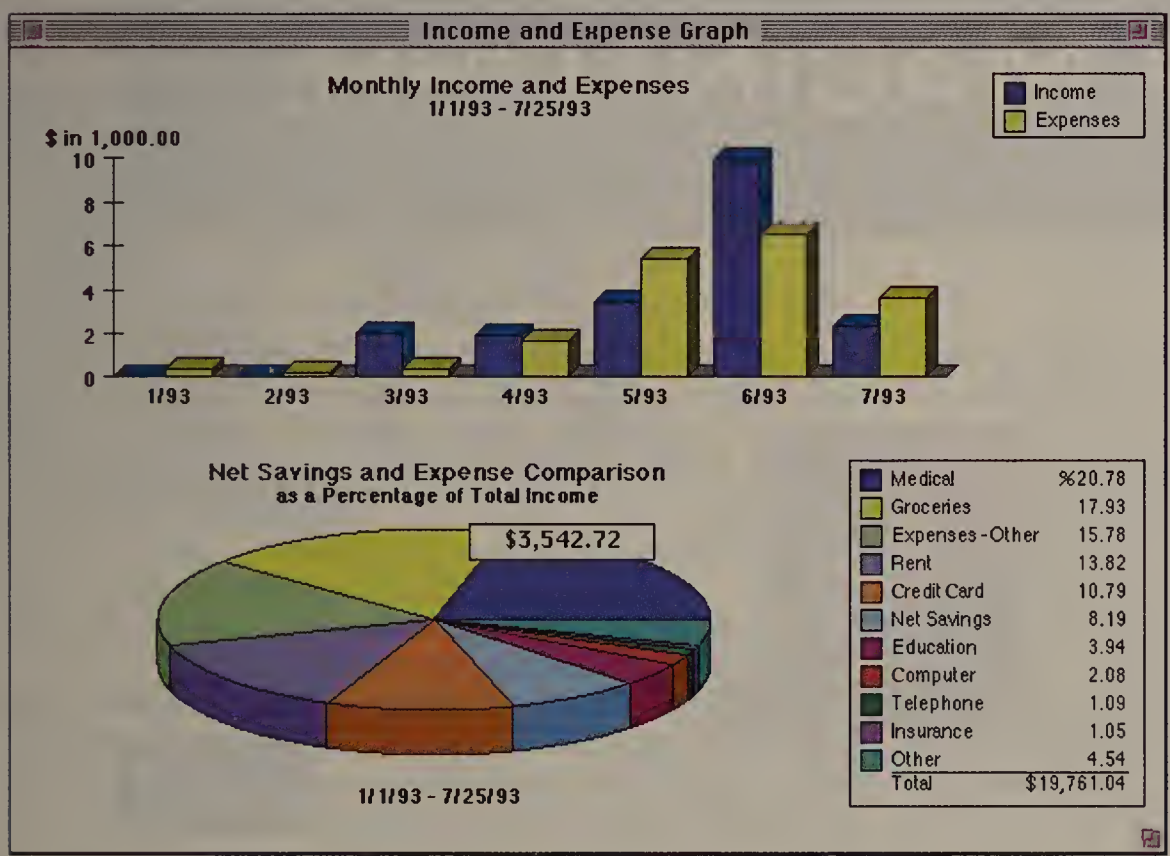
Quicken comes with a clear, well-organized, and informative manual, as well as a separate 60-page manual that details how to use the program to manage small businesses such as managing rental properties or consulting. But I didn't need either manual much because the on-screen Qcards (pop-up instructions) provided clear context-sensitive help when I needed it most.

Adding It All Up

Quicken is easy to learn and powerful to use, even for a financial neophyte, and it works the way software should work. Almost every time I wanted to explore the meaning of something, I could double-click on it to get more detail. You can move from a summary report down to the details, for instance, without negotiating lots of dialog boxes or entering arcane search requests. Click on any slice of a pie chart, for example, to see the actual dollar amount for that category.

As powerful as Quicken is, it is always willing to take a backseat to you. You can use its QuickBudget feature to generate a suggested budget based on your past spending patterns, for example, but you can also change any of its suggested amounts. Similarly, all of the predesigned reports can be customized.

If you're past the point of using color-coded coffee cans to manage your money, Quicken can help you make sense of your finances.—LIZA WEIMAN



Where's It All Going? Quicken's Income and Expense Graph shows your monthly income and expenses in a bar chart (top) and breaks down your spending by category in a pie chart (bottom). If you click on a pie slice, the dollar amount appears.

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Micro Planner Manager 1.1

Project-Management Software

PROS: Generally intuitive interface; flexible reporting; strong scheduling and resource analysis; cross-project resource optimization.
CONS: Does not support publish and subscribe; steep learning curve for advanced features.
COMPANY: Micro Planning International (303/757-2216). **LIST PRICE:** $695.

MW ★★★

IF YOU'RE SERIOUS ABOUT MANAGING medium-size projects on the Macintosh, it's a tight race between Micro Planner Manager, Microsoft Project, and Project Scheduler 5 from Scitor Corporation.

Micro Planning International's entry accommodates various experience levels and management styles. For instance, Micro Planner Manager's unusual "inner desktop" mimics the Macintosh desktop metaphor, so entry-level planners can easily navigate folders of reports, charts, resource groups, and subprojects.

For more-involved projects, Manager boasts sophisticated scheduling, resource-management, and analysis tools—features typically missing from midprice software. In fact, Manager is almost identical to MPI's high-end $1995 Micro Planner X-Pert program; the one big difference is task capacity (1500 activities versus X-Pert's 10,000-job limit).

Unfortunately, the straightforward desktop design doesn't always extend to the more-involved aspects of project management, such as scheduling and report customization. Accomplishing those tasks requires multiple dialog boxes, menu choices, and a more than casual understanding of project management.

Micro Planner Manager 1.1 ensures that resources aren't given different tasks to perform at the same time; it resolves these conflicts even when resources are moved among several active projects. Although Manager does not support publish and subscribe, it runs on various local area networks, and it lets you swap files from X-Pert, MacProject II, and Insta-Plan (MPI's DOS project planner).

Blends Planning Tools with Graphical Interface

You'll probably feel most comfortable building a project from Manager's interactive PERT network screen. Just click and a box appears, representing a task. You connect jobs in the desired order by drawing a line with the mouse. You can also enter and change data through the Gantt chart, spreadsheet table, and task outline.

Manager accommodates 20 resources per task (200 total resources per project) and allows 5 subprojects per plan. While these caps are low, Manager's capacity should satisfy most intermediate needs.

Selecting a task box reveals a multipurpose data entry form. As you page through the form's sections, it's easy to add resources, change organizational codes, and enter deadlines. Activities can wait until the last moment to start, which is helpful for just-in-time manufacturing.

Version 1.1 focuses on multiproject scheduling. You can merge multiple projects into one master plan—that's how resource distribution across many projects is accomplished. Additionally, links between activities in different projects help synchronize large plans; this ensures, say, that you don't start marketing a product until enough has been produced to meet anticipated demand. Manager 1.1 also adds task splitting, which suspends a task so scarce resources can shift temporarily to a more critical activity.

As You Like It

The Gantt chart, like Manager's other windows, is readily personalized. Suppose you want to combine all of the research department's design tasks into one time bar for a high-level meeting, but the tasks are spread throughout the project. In the Gantt chart you can easily summarize the information using the Work Breakdown Sort Code. Specialized Gantt symbols and 14 active filters further define how information appears.

However, defining displays through dialog boxes limits ad hoc changes. For example, you won't be able to change column widths or collapse headings directly in a table.

Also, I sometimes found the linked Gantt chart (which shows how tasks are interrelated) to be confusing. The graphics could more clearly show progress and uncommitted time, too. On the plus side, you can customize various tables by selecting from many elements—in some cases more than 100—and then save the view for later recall.

Another feature helps you organize a schedule in outline style, offering the expected options to indent tasks, hide levels, and move groups. Still, you must go through several steps to convert an outline to a network, reducing its usefulness. Overall, Manager feels rigid compared with other mainstream project managers.

Scheduling Prowess

Micro Planner Manager doesn't compromise in scheduling and reporting. You can, for example, evaluate four schedules side by side, as well as compare current progress to the baseline plans.

Manager provides both deadline- and resource-critical scheduling. Put simply, Manager shows you how you can meet shortened deadlines by adding overtime or resources, and conversely, how to work within the bounds of limited resources.

Manager offers several ways to model real-world conditions. You get a basic calendar for each resource, plus the option to modify resource numbers or availability from day to day. These change-points also cover consumable items such as materials. You might also set work-hour thresholds so Manager won't schedule unrealistic amounts of overtime. An efficiency factor recognizes that not everyone performs at the same level (someone with a lower rating will take longer on a job than a more experienced worker).

When project managers smooth out work loads (level resources) there's often a danger that tasks may be delayed too long while waiting for resources. Micro Planner Manager not only lets you impose a time limit on these delays, but also lets you unlock jobs right away, even if not all resources are available.

Manager 1.1 has a number of standard graphic, planning, and cost summaries. Sixteen cost reports, for instance, provide cash-flow forecasting, job costing, earned-value analysis (which is fast becoming a standard way to judge commercial projects' performance), and wastage analysis (which charts inefficiencies when resources are underused or overloaded). Once generated, reports can be reduced to icons on the inner desktop for quick recall, but they're continuously updated to reflect new information.

The Scorecard

Each of the major players in the mainstream project-management market has unique strengths and some significant weaknesses. Micro Planner Manager 1.1 adds cross-project resource sharing and leveling, while Microsoft Project and Project Scheduler 5 offer better ease-of-use. PS5 manages larger projects and handles multiple projects slightly better; its main limitation is in the area of report formatting. However, when you require scheduling and analysis depth for a reasonable price, Micro Planner Manager holds the edge.—MIKE HECK

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Two Graphics Utilities

Graphics-Conversion Software

DeBabelizer 1.5

PROS: Huge number of file formats supported; excellent palette manipulation; easily created, powerful scripts; batch file processing.
CONS: Poor interface for tonal correction.
COMPANY: Equilibrium Technologies (415/332-4343). **LIST PRICE:** $299.

MW ★★★★

Transverter Pro 1.0

PROS: Converts PostScript files to bitmaps and to editable Illustrator-format PostScript.
CONS: Doesn't work with all PostScript files; not all conversions are perfect. **COMPANY:** TechPool (216/291-1922). **LIST PRICE:** $395.

MW ★★★

IF YOU SPEND MUCH TIME PRODUCing documents or multimedia presentations on the desktop, sooner or later you will come across one of these situations: You have a pile of graphics files in one format, and you need to convert them to some other format so you can use them in your program. Or you have an assortment of color images that you need to convert to gray scale. Or you get an encapsulated PostScript (EPS) file from someone, and you need to convert it to an editable form.

That's where graphics-conversion utilities come in. Two new programs—DeBabelizer 1.5 and Transverter Pro 1.0—address different areas of the graphics-conversion imbroglio, each in impressive ways.

DeBabelizer

DeBabelizer tackles bitmapped graphics conversion—and a whole lot more. It doesn't work with object-oriented graphics, with the exception of object-oriented PICT files, which it converts to bitmaps on opening. With bitmapped graphics, however—black-and-white, gray-scale, or color—it can work wonders.

At its most basic level, DeBabelizer can open a graphics file (in any of a huge selection of formats) and save it in a different format. That in itself is a useful capability—for instance, if you have a graphic in GIF format (CompuServe's native graphic format) and you want to convert it to TIFF to import into your page-layout program.

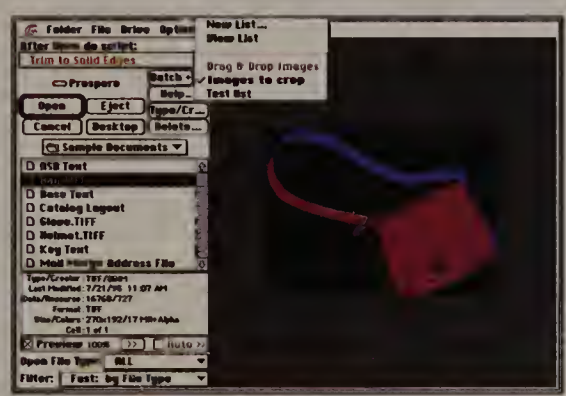
Beyond simple file-format conversion, however, DeBabelizer enables you to manipulate images with an astounding variety of methods. The program has simple tools for editing an image—pencil-drawing, erasing, selecting, copying, and pasting—but Photoshop-like tools are not DeBabelizer's greatest strength. The program is best suited for overall adjustments to whole images or batches of images.

When it comes to remapping color palettes, for instance, you can convert bit depths and color modes; adjust tonal values by altering their response curves; dither an image in color, gray-scale, or black and white; manipulate color channels individually; and a whole lot more. Using DeBabelizer's Super Palette option, you can build an optimized palette based on the colors in a series of images, and apply that palette to all the images—incredibly useful for multimedia work in which you're using a fixed palette of limited size.

You can even use Photoshop plug-in filters in DeBabelizer (though unfortunately, several of the filters that Adobe provides—such as sharpening—do not work).

You can build any of the program's functions into a script, and use the script to perform multiple actions consecutively on an image. You can also control DeBabelizer via Apple events scripting, but the internal DeBabelizer scripting interface makes scripts so easy to create, edit, and execute, there's not much need for Apple events.

Scripting automates multiple tasks, and DeBabelizer's batch processing tools take that a step further. You can run multiple scripts on multiple files, completely automating what could be an extremely complex conversion and image-manipulation process.

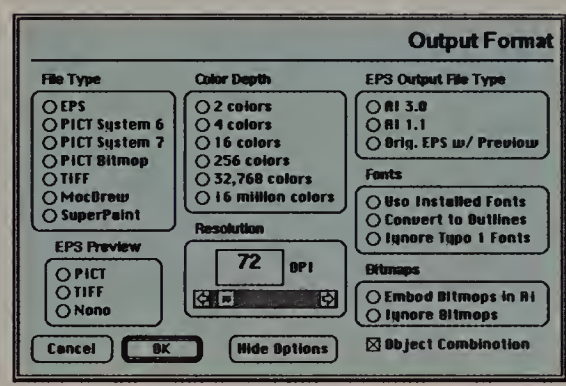


Bigger than Your Average Dialog Box DeBabelizer's Open dialog box is a good example of the number of features in the program and how densely they're packed. The pop-up menu at the top controls DeBabelizer's batch processing.

Though there are a few things I'd like to see changed in DeBabelizer (the interface for tonal adjustments isn't nearly as good as Photoshop's Levels dialog box, for instance), this is the graphics-conversion tool of my dreams. The sheer quantity of options will be daunting for less technical users (see "Bigger than Your Average Dialog Box"), but if you spend any significant amount of time dealing with file conversion or image adjustment, you should have DeBabelizer.

Transverter Pro

Transverter Pro does not offer nearly the range of features that DeBabelizer does, but Transverter Pro's capabilities are in many ways more remarkable.



Transverter Options There's a good deal of flexibility in Transverter Pro when it comes to controlling the format of the output file. The options available vary depending on which file type you have selected.

It can read PostScript files and convert them to a variety of bitmapped and object-oriented formats. It will add a screen preview to an EPS file that doesn't have one (for instance, one that came from an IBM graphics application).

Transverter can even convert generic PostScript files to Illustrator 1.1– or 3.0–compatible PostScript, so you can edit the files in Illustrator or FreeHand. Yow. This is a PostScript interpreter and distiller disguised as a graphics-conversion program.

As you might expect of a program that strives to fill such a tall order, Transverter Pro is not perfect. It has trouble reading some PostScript files, and its conversions are not always flawless (as when lines and fills are not rendered properly, especially common with composite objects).

For situations in which you really need to edit a graphic and all you have is an EPS file, Transverter can be a lifesaver. If you want bitmapped renditions of EPS graphics (for instance, to convert a logo to TIFF format for a cover sheet that you will send via fax modem), Transverter Pro is the easiest way to get from here to there.—STEVE ROTH

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Circle 109 on reader service card

DataLink PB; Axcell Cellular Interface

PowerBook Cellular Modem Package

PROS: Built-in speakerphone with digitized voice mail; 14.4-Kbps fax/data speeds; MNP Class 10 protocol for cellular phones; caller ID support. **CONS:** Installation requires soldering; modem guard tone requires altering modem dialing strings; digitized messages not compressed. **COMPANY:** Applied Engineering (214/241-6060). **LIST PRICE:** $824; separately, DataLink PB $525, Axcell $299.

MW ★★★

IF YOU REALLY NEED TO TAKE THE whole office with you when traveling, Applied Engineering's DataLink PB internal high-speed fax modem and Axcell cellular-phone interface may be just the ticket. This combo gives you a complete office presence—with automatic answering machine, caller ID, and voice mail—anywhere you can use a cellular phone.

The package consists of a PowerBook internal modem board; an external cellular-phone interface; Faxstf fax software; CommPhone voice-mail software; an installation guide; and separate manuals for modem, fax, voice-mail, and cellular components. The modem supports 14.4-Kbps speeds for both data and fax, as well as a speakerphone using the PowerBook's built-in speaker and an external microphone. The CommPhone software provides phone-book, autodialer, answering machine, and sophisticated voice-mail features, all of which work with or without the Axcell cellular interface.

Applied Engineering recommends using an authorized Apple dealer or sending your PowerBook to Applied for installation, in order to keep your PowerBook's warranty intact. Even if your PowerBook is out of warranty, you should use an experienced technician. The installation guide's muddy photos provide enough detail only for someone with considerable experience handling PowerBook innards. The modem is a tight fit, requiring some adjustment to insulating spacers; installing voice mail entails removing the motherboard and soldering wires to the audio jacks. Putting it all back together is nerve-racking for all but veteran PowerBook techies. However, Applied Engineering says a new version of the DataLink PB modem has solderless connections, but it still requires installation by an Apple-certified technician, to prevent voiding the PowerBook's warranty.

The modem's data mode supports speeds up to 14.4 Kbps, with automatic fallback to slower speeds, as well as V.42 error correction and V.42bis MNP Class 5 compression—all standard for modern high-speed modems. For cellular connections, the modem provides MNP Class 10 protocol. MNP Class 10 accommodates temporary signal loss due to cell handoffs, and adapts to noisy connections by dynamically varying speeds and data-packet size. This greatly improves the reliability of an in-motion cellular connection when the remote modem also supports MNP Class 10, as many commercial online services do. The supplied Faxstf software is a standard package providing fax send, receive, archive, and logging functions.

One DataLink PB default feature, called modem guard tones, can cause some difficulty when connecting to certain modems. The modem guard tone is an intermittent beep that DataLink PB starts sending immediately after dialing, similar to the beep you hear after a fax modem dials. Its purpose is to alert the called party that a modem is on the line. Unfortunately, some modems interpret these beeps as an incoming fax and switch to fax mode, causing the connection to fail. To turn off modem guard tones, you must insert a caret (^) in your modem dialing strings—an inconvenience if you share communications applications with a desktop Mac.

The Axcell Cellular Interface is a small external box about the size of a pack of playing cards. You plug its short cable into an OKI-900 phone (or an equivalent model from AT&T or NEC) and plug a supplied phone cable into the Axcell's modular phone jack. The other end of the phone cable goes into the modem's phone jack. An internal 9-volt battery powers the Axcell whenever the cellular phone is turned on, giving about 5 hours of continuous operation and 30 hours of standby operation. You can double this time by enabling the Axcell's low-power mode. The Axcell provides the modem with dial-tone and ring signals, and translates modem touch-tone dialing to cellular-phone dialing. You also can use the Axcell with other standard telephone equipment such as answering machines, headsets, and autodialers.

In tests using the cellular interface without MNP Class 10, connections at 14.4 Kbps were reliable as long as I remained stationary. In a moving car, though, varying signal strengths and cell handoffs soon broke the connections. Repeating the same tests over the same route with MNP Class 10 yielded some throughput slowdowns but no disconnections, demonstrating MNP Class 10's usefulness.

The DataLink PB's most obvious innovation, though, is its voice capability. The CommPhone application enables you to use your PowerBook as a standard telephone, using a headset or handset (not supplied), or as a speakerphone, using the PowerBook's built-in speaker and the external microphone supplied with every PowerBook. Alternatively, you can buy Applied Engineering's $99 EarPhone—a combined earphone-microphone device that fits in your ear—which gives you complete hands-free operation. The location of the built-in mike on newer PowerBooks causes an audio-feedback squeal, making it unusable for the speakerphone.

CommPhone provides a telephone dialing pad for manual dialing or phone answering, and a phone book for autodialing prestored numbers. The phone book lets you import an existing telephone database. An automatic activity log records the date and time of all calls and, if your local phone company provides caller-ID service, the phone numbers of incoming calls. In fact, when answering a call with caller-ID enabled, CommPhone announces the caller's name and phone number in a dialog box (this feature could not be tested in my location).

CommPhone also provides answering-machine functions rivaling those of many voice-mail systems. Callers hear an outgoing message you've prerecorded; then they can leave a message, which CommPhone digitizes and stores on disk. Optionally, a caller can enter a special access code and receive a private voice message you've left specifically for them. A remote mode lets you call in to replay messages, change the outgoing message, or record memos for callers. The software supports as many outgoing messages, private memos, and incoming messages as your hard drive can hold. Unfortunately, CommPhone doesn't compress digitized sound—each second recorded requires 25K of disk space. You can limit the length of incoming messages to help minimize disk usage.

If you need a full-blown office on the beach or in your tree house, the DataLink PB–and–Axcell Cellular Interface combo is a well-executed, reasonably priced solution.—MEL BECKMAN

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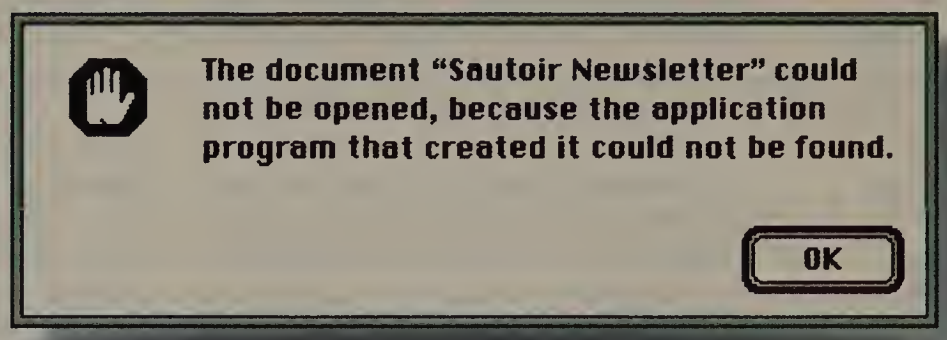

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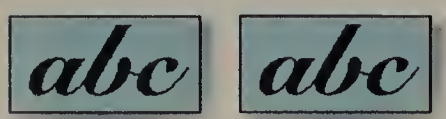

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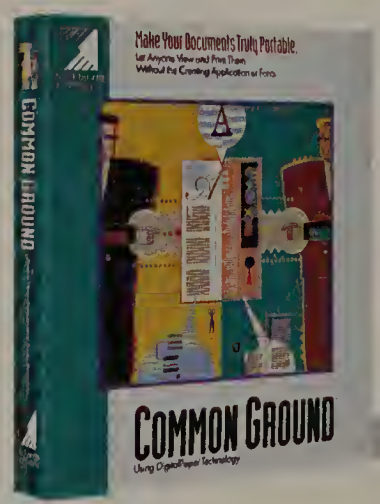

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Circle 27 on reader service card

PowerLink Presentor

Duo Dock

PROS: Supports video output to a wide variety of displays; provides ports for ADB, floppy drive, and sound output; lightweight and compact. **CONS:** Wobbly docking connection; erratic behavior of virtual screens feature; no SCSI port. **COMPANY:** E-Machines (503/646-6699). **LIST PRICE:** $499.

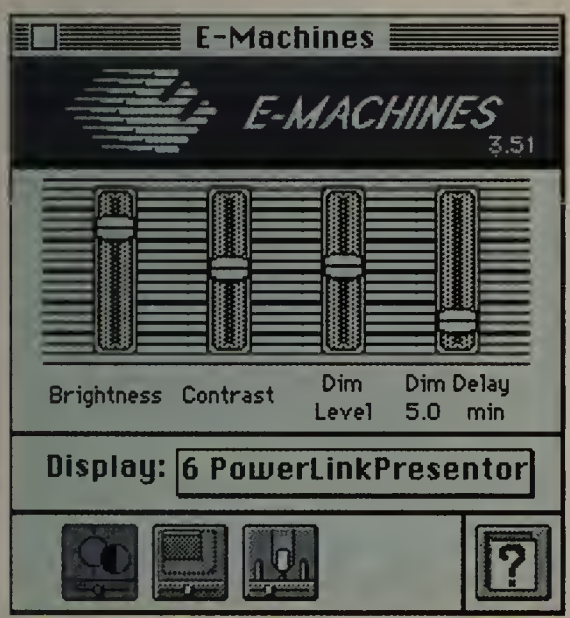
MW ★★★

THE POWERLINK PRESENTOR IS A portable dock that enables you to connect a PowerBook Duo to just about any screen—a Mac display, SVGA monitor, LCD panel, or even a plain old television—for output of up to 256 colors.

The pleasingly light and compact Presentor unit snaps right into the docking port on the back of the Duo—though not as snugly as you might wish. Unlike Apple's MiniDock, the Presentor wobbles when plugged in, as though it is not connected properly and might disengage.

On the positive side, the Presentor comes with a standard composite-video cable—the kind that plugs directly into the video-in jack of your television or VCR—and a Mac-to-VGA video cable adapter. The unit also ships with a padded carrying case that offers some protection for the metal prongs that protrude from the front of the undocked unit.

Like the MiniDock, the Presentor outfits your Duo with an ADB port, a sound-output port, and a floppy drive port so you can connect a mouse, keyboard, and other peripherals. The Presentor does not, however, provide a SCSI or sound-input port (both of which the MiniDock has).



Screen Controls Once your Duo is connected to a display, you can adjust brightness, contrast, and screen dimming from within the control panel.

To use the Presentor's video-output capabilities, you must install the accompanying PowerLink software—a single control panel. The control panel allows you to set up the Presentor for output to a variety of computer monitors and televisions and includes controls for two other helpful display options. The Safe-title feature places a narrow black border around the screen display to ensure that the menu bar or other items at the edges of the screen don't get cut off (or intolerably distorted) by an alien display device. The Flicker-free option activates the Presentor's video-smoothing hardware, filtering out much of the flicker inherent in RGB-to-NTSC television conversions. (However, activating video smoothing also disables two of the Presentor's other features—screen magnification and virtual screen.) Of course, even with Safe-title and Flicker-free on, the Presentor's output to a television doesn't look great. To be fair, that's not the Presentor's fault; televisions make lousy display devices under any circumstances, due to their crude resolution.

Once it's set up, you can use the display supported by the Presentor as a second monitor or to mirror the Duo's display. To do the latter, you select Video Mirroring in Apple's PowerBook Display control panel. (E-Machines says some users have had problems using the Presentor in Video Mirroring mode due to a bug in the PowerBook Display software and, sure enough, I did experience a few system freezes while trying it out.)

The Presentor also comes with a second control panel that can be added using Custom Install. This control panel provides a number of enhancements to the Presentor's functions. You can set screen brightness, contrast, and dimming levels using slider bars; enlarge menu names and commands for increased readability; magnify the screen image by 200 percent; and define keyboard shortcuts for some main Presentor commands.

Most interestingly, you can set up virtual screens—screens that display a desktop larger than your display. The Presentor will let you pan to other areas of the desktop simply by dragging the pointer to the edges of the screen. Though the feature can be useful for working with large documents, I experienced erratic results, occasionally losing the screen image at the display's edges.

Still, PowerLink Presentor does a fine job with its primary function—providing Duo users with a simple and compact solution to video output.—JOSEPH SCHORR

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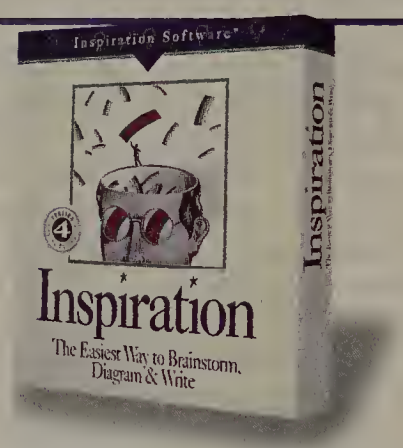

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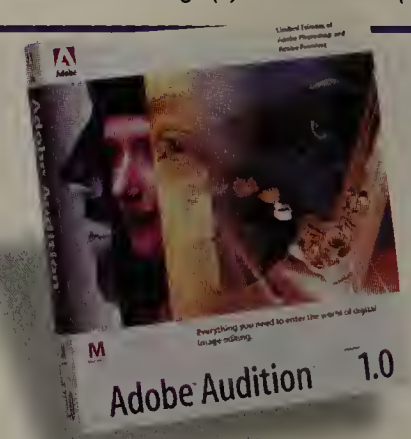

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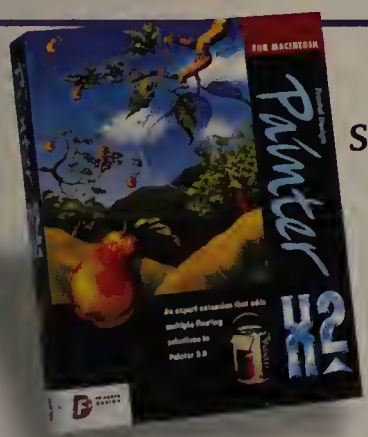


WHILE SUPPLIES LAST

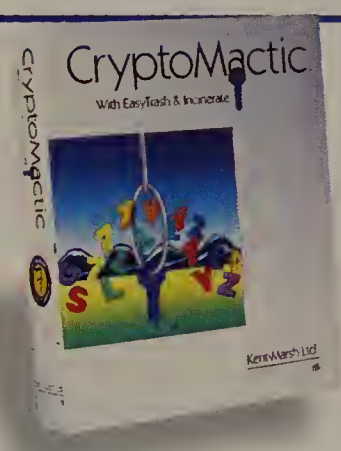
Fractal Design
1564 *PainterX2*—An extension to Painter 2.0; revolutionizes the way artists and designers combine and orchestrate multiple graphic elements. Floating selections can be painted, scaled, rotated & distorted **special offer $79.**

★Expert Software ... 30 day MBG
4870 Expert Color Paint, 1737 Landscape,
8619 Home, or 1731 Office Design *ea.* 29.
Fractal Design
1068 Sketcher 1.0 ..... 93.
10402 Painter 2.0 265. 1564 PainterX2 *special* 79.
Gold Disk
12279 Astound 249. 12276 Animation Works 115.
Graphsoft
11723 BluePrint... 199. 11724 MiniCad +.. 589.
Gryphon
4202 Morph 2.0 ..... 149.
★Letraset ... 30 day MBG
Letraset FonTek Library - Full line avail. call
Light Source
11059 Ofoto 2.01 ..... 275.
★Manhattan Graphics ... 30 day MBG
4990 Ready,Set,Go! ..... 219.
Postcraft International
2210 Effects Specialist 2.0 ..... 89.
Quark
7612 QuarkXPress 3.2 ..... 599.
★Ray Dream ... 30 day MBG
12264 JAG II *(increase image quality)* ..... 89.
4761 Designer 3.0 000. 12280 addDepth 1.0.2 125.
★Specular International ... 30 day MBG
4962 Infini-D 2.5 ..... 699.
★SuperMac/E-Machines ... 30 day MBG
10321 E-Machines T16II Monitor ..... 1299.
8028 Futura II SX 459. 8027 Futura II LX 819.
8005 Ultura LX ..... 1189.
★Synergy Software ... 30 day MBG
6617 KaleidaGraph 3.0 ..... 139.
★T/Maker ... 30 day MBG
ClickArt *(bitmapped)*.. 34. or *(EPS)*... 55.
3144 Incredible Image Pack ..... 89.

PROGRAMMING/UTILITIES

★Abbott Systems ... 30 day MBG
11735 FindAll 1.0 36. 5236 CanOpener 2.0 59.
2515 Calc+..... 36. 9578 Kaleidoscope... 25.
★Aladdin Systems ... 30 day MBG
7410 StuffIt SpaceSaver 3.4 34. 6740 Deluxe 65.
★Apple Computer ... 30 day MBG
1206 At Ease 44. 7072 QuickTime Starter Kit 105.
1074 System 7.1 *(with free PCTV video)* ..... 79.
★Berkeley Systems ... 30 day MBG
1502 The Disney Collection Screen Saver..... 28.
5737 After Dark 2.0x *(30+ screens!)* ..... 28.
2198 More After Dark.. 23. 2196 Bundle.. 39.
3392 Star Trek: The Screen Saver ..... 34.
★Binary Software ... 30 day MBG
11989 Square One 1.5 ..... 45.
12475 Bloopers ..... 19.

Casa Blanca Works
1593 Drive7 2.3 ..... $49.
★CE Software ... 60 day MBG
1727 CalendarMaker 39. 7927 QuicKeys 3.0 105.
★Central Point ... 60 day MBG
10595 Safe & Sound 32. 5041 MacTools 2.0 89.
★Claris Clear Choice ... 30 day MBG
11205 Retrieve It! ..... 46.
★Dantz Development ... 30 day MBG
9115 DiskFit Direct 1.0... 29. 3393 Pro .... 72.
5255 Retrospect.. 145. 7945 Remote 2.0.. 259.
★Datawatch ... 30 day MBG
4803 Virex/Mac 57. 11486 SuperSet Utilities 85.
★Fifth Generation ... 30 day MBG
5342 MacPak 1.0.. 96. 3955 Suitcase 2.1.3 53.
7404 DiskDoubler 52. 4838 AutoDoubler... 58.
12298 AutoDoubler/DiskDoubler Combo ..... 85.
10398 CopyDoubler 39. 7704 Public Utilities.. 98.
FWB, Inc.
2999 Hard Disk ToolKit 125. 7929 Personal 49.
★Golden Triangle ... 30 day MBG
11731 TimesTwo *(1.44)*.. 83. 11773 *(800K)*.. 83.
★Harvard Systems Corp. ... 30 day MBG
11193 Kai's Power Tools for Photoshop ..... 89.
★Inline Design ... 30 day MBG
7068 INITPicker 49. 1740 Redux Deluxe 2.01 49.
★Kent Marsh Ltd. ... 30 day MBG
9513 FolderBolt 71. 1839 NightWatch II ..... 89.
1725 CryptoMactic 1.01 ..... 55.



★Kent Marsh Ltd. ... 30 day MBG
1725 *CryptoMactic*—Invincible encryption built into the desktop. Optional use of override makes its security impenetrable. Includes EasyTrash & Incinerate, for trashing or shredding w/a single keystroke. See line listings for add'l prods. **$55.**

★Attain Corporation ... 60 day MBG
8465 *IN CONTROL*—1992 *MacUser* Editors' Choice Award for *Best Organizational Tool.* The new standard. The only product to manage activities as outlines, prioritized lists, and calendars! ..... **$85.**

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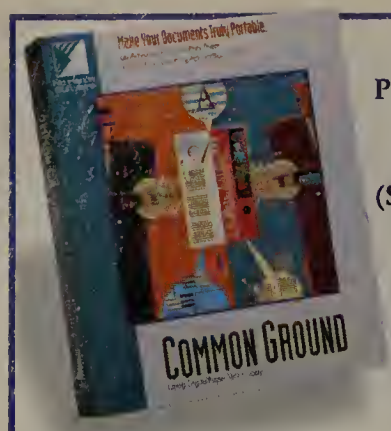


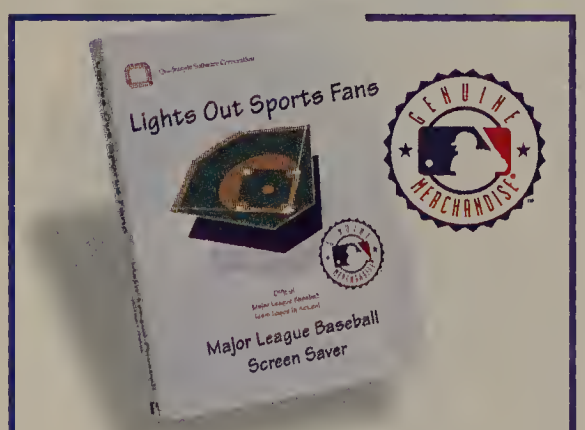
40 POSTSCRIPT FONTS FREE! ($1200 value)

★**No Hands Software ... 30 day MBG**
8377 *Common Ground*—Create documents that are pixel-for-pixel identical with the original and can be viewed and printed by anyone, even if they don't have the creating application or fonts ..... **$122.**

★**Kiwi Software ... 60 day MBG**
11736 Screenscapes..... 34.
★**Logical Solutions ... 30 day MBG**
10169 7th Heaven 2.5 67. 11191 Chameleon 39.
MicroMat Computer Systems
3732 MacEKG II 89. 11794 MicroProbe ADB 69.
2998 DriveTech..... 41.
★**No Hands Software ... 30 day MBG**
8377 Common Ground..... 122.
8382 Magnet ..... 49.
★**Now Software ... 30 day MBG**
12303 Now Compress.. 65. 12304 Now FUN! 45.
6925 Now Utilities 4.0..... 84.
★**Quadrangle ... 60 day MBG**
4393 Lights Out Sports Fans..... 35.
Stac Electronics
11568 Stacker for Macintosh..... 65.
★**Symantec ... 60 day MBG**
5176 SAM 3.5 64. 6748 Norton Utilities 2.0 95.
11727 C++ 6.0 for Mac 339. 2688 THINK C 6.0 199.
★**Teknosys ... 30 day MBG**
5203 Help! 88. 12291 Competitive Upgrade 49.
UserLand Software
4753 Frontier 2.0..... 185.

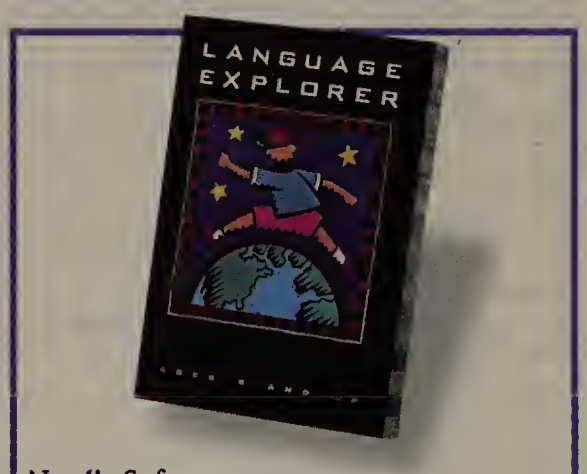
LEARN & PLAY

ActiVision
1039 Shanghai II 19. 1134 Lost Treasures Vol. I 29.
Broderbund Software
Carmen Sandiego Series *(CP)*..... *ea.* 29.
8285 Where/World Carmen Sandiego Deluxe 47.
11561 TRISTAN Pinball..... 35.
Buena Vista Software
1711 Heaven and Earth ..... 34.
Bungie Software
7445 Pathways Into Darkness..... 39.



★**Quadrangle ... 60 day MBG**
4393 *Lights Out Sports Fans*—A Major League Baseball screen saver with 10 exciting game plans. Watch your favorite Major League Baseball team logos in action while they prevent burn-in. Includes all 28 teams.... **$35.**

★**Callisto ... 30 day MBG**
11369 Super Mines $29. 11756 Super Maze Wars $39.
★**Carina ... 30 day MBG**
7761 Voyager II, the Dynamic Sky Simulator.. 99.
★**Casady & Greene ... 30 day MBG**
ZOA, Crystal Crazy, or Spaceway 2000 *ea.* 31.
★**Centron Software ... 30 day MBG**
5910 Crossword Creator 39. 8524 Casino Master 45.
★**Davidson & Associates ... 30 day MBG**
10953 Kid Pictures 19. 2574 MathBlaster Plus 34.
7942 Kid Works 2 34. 1076 Zoo Keeper..... 34.
Delta Tao Software
2536 Spaceward Ho! or 2439 Strategic Conq. 36.
★**Edmark Corporation ... 30 day MBG**
7155 Kid Desk 24. 7318 Millie's Math House 29.
1078 Bailey's Book House ..... 29.
Electronic Arts
1907 PGA Golf 38. 2805 Tournament Course 18.
Game Tek
7433 Wheel of Fortune..... 24.
Graphic Simulations
8083 Missions at Leyte Gulf *(req. Hellcats)*.... 20.
4756 Hellcats Over the Pacific 1.0.3 ..... 38.
★**Great Wave ... 30 day MBG**
6693 KidsMath 2.0 or 2276 Kid's Time .... *ea.* 25.
8527 NumberMaze or 3471 DaisyQuest.. *ea.* 35.
★**HyperGlot Software ... 30 day MBG**
(Language Tutorials: full line available)
★**Inline Software ... 30 day MBG**
1562 3 in Three... 31. 11188 Pax Imperia... 44.



Nordic Software
7723 *Language Explorer*—The fun way for kids of all ages to learn new languages. Includes word sets for English, French, German, and Spanish. Builds vocabulary using color animation and sound..... **$29.**

Interplay Productions
1615 Mario Teaches Typing..... 29.
Bridge Deluxe or Out Of This World ea. 34.
★**Learning Company ... 30 day MBG**
Reader Rabbit Series..... *ea.* 34.
★**Leister Productions ... 30 day MBG**
7126 Reunion 3.0..... 115.
★**Maxis ... 30 day MBG**
11272 SimAnt..... 29. 11270 SimLife..... 39.
11629 SimCity Supreme 45. 8157 Kid's Studio 35.
5279 SimCity Classic 24. 11628 A-Train Bun. 45.
★**MECC ... 30 day MBG**
3959 Word Munchers 18. 3963 Oregon Trail 28.
★**Microsoft ... 30 day MBG**
2868 Flight Simulator 4.0 *(CP)*..... 42.
Nordic Software
7723 Language Explorer..... 29.
Psygnosis
11562 Lemmings..... 35.
Software Toolworks
4619 Mavis Beacon Typing 2.0 *(CP)*..... 29.
5201 The Miracle *(piano teacher)* ..... 349.
★**Spectrum Holobyte ... 30 day MBG**
3464 Tetris..... 23. 4835 Super Tetris .... 29.
3017 Wordtris 1.0 29. 9113 Falcon Color.... 41.
StudyWare
ACT, GMAT, GRE or SAT Prep ..... *ea.* 29.
Velocity
11538 Spectre Supreme 40. 11537 LAN 2-Pak 52.
Virgin Software
Scrabble or Monopoly *ea.* 19. 1746 Risk 29.

Caere
7925 *OmniScan*—Caere's OmniScan is a handheld scanning solution with integrated OCR (OmniPage Direct), image-editing (Image Assistant) and fax capabilities (FaxMaster) in a convenient package ..... **$399.**

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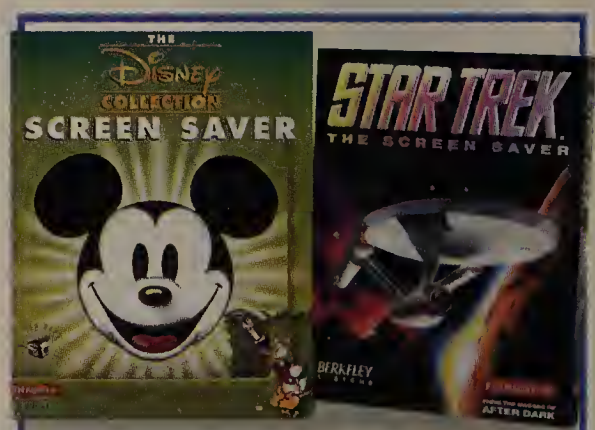
Articulate Systems
Voice Navigator SW (Head/Desk Mike) *ea.* 319.
Coda Music Technology
8188 MusicProse 2.1 189. 5604 Finale 3.0 549.
Macromedia
7651 Action Mac 339. 5087 Director 3.1 .... 799.
4598 MacRecorder Sound System PRO..... 189.
★**Media Vision ... 60 day MBG**
11738 Pro AudioSpectrum 16 Nubus..... 329.
Nova Development
11101 Kaboom! 29. 12278 w/More Kaboom! 40.
Opcode Systems
12230 Midi Translator II.. 42. 12225 Vision.. 339.
12226 Audioshop 1.05 61. 12227 Musicshop 1.0 99.
Passport Designs
8250 Encore..... 379.
Radius
1738 PrecisionColor Pivot *(reqs. interface)*.. 999.
RasterOps
8944 24STV 799. 3043 Paint Board Turbo 1199.
3048 20/20 Multiscan Color 20" Display..... 1499.
Sigma Designs
1565 MovieMovie 299. 11541 ErgoView 17 1199.
Sony
10530 CPD-1430 14" Multiscan Trinitron Monitor 689.
10529 CPD-1730 17" Multiscan Trinitron..... 1149.
★**SuperMac/E-Machines ... 30 day MBG**
4122 VideoSpigot LC 245. 4164 *(for NuBus)* 375.
7677 SuperMatch 17" Color 999. Trade Up.. call
12704 20" + Color 1799. 10321 ColorPg. T16II 1299.
4720 21" Platinum Two-Display ..... 1099.
11983 Thunderstorm 619. 11982 Thunder/24 2299.
9066 Futura SX.... 369. 9065 Futura MX... 649.
7985 EtherDock..... 639.
10322 E-Machines Presentor..... 439.



★**Berkeley Systems ... 30 day MBG**
1502 *The Disney Collection Screen Saver*—Incl. over 15 well-known Disney displays..... **$28.**
3392 *Star Trek: The Screen Saver* ..... **34.**
5737 *After Dark 2.0x (30+ screens!)*..... **28.**
2196 *After Dark & More After Dark Bundle* **39.**

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10330 From Alice To Ocean Book *(w/CDs)* ... $39.
Cinderbund
3730 Just Grandma and Me ..... 34.
9059 Arthur's Teacher Trouble ..... 41.
CD Technology
2321 CD-ROM Caddy.. 11. 2533 *(5 pack)*. 49.
4084 America Alive! ..... 75.
8057 Porta Drive CD-ROM Drive ..... 619.
FWB, Inc.
10198 CD ToolKit.. 49. 11582 HammerCD.. 659.
★ **Highlighted Data ... 30 day MBG**
1488 Elec. Map Cabinet or 7771 Webster's Dict. 149.
Interplay Productions
7111 Battle Chess CD-ROM Enhanced ..... 45.
★ **Media Vision ... 60 day MBG**
CD-ROM Multimedia Kit *(Sony or NEC)* 699.
★ **Microsoft ... 30 day MBG**
1741 Musical Instuments on CD-ROM ..... 55.
NEC
6577 CDR-38 Portable CD-ROM Drive ..... 369.
6582 CDR-74-1 CD-ROM Drive ..... 597.
Peripheral Land, Inc. (PLI)
12441 Multi-Session Int. CD-ROM Super Bun 599.
12442 Multi-Session CD-ROM Drive Bundle .. 699.
★ **Presto Studios ... 30 day MBG**
11330 The Journeyman Project ..... 56.

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★**Dantz Development ... 30 day MBG**
7945 *Retrospect Remote 2.0*—Powerful Mac network backup software. For automatic, centralized backup and archiving. Supports compression, encryption, & verification **$259.**
3393 *DiskFit Pro*—Efficient media backup **72.**

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★**Maxis ... 30 day MBG**
5279 *SimCity Classic*—Fight urban blight and build a prosperous city, or risk disaster!. **$24.**
8157 *Kid's Studio* by CyberPuppy—The next generation in storytelling, the ultimate upgrade for creative kids ..... **35.**

U.S. Robotics
11842 *Sportster (14.4) Mac & Fax*—Data and Fax to 14,400 bps. V.32bis, V.42/MNP 2-4 error control, V.42bis/MNP 5 compression. Includes LC version FAX/*stf* and MicroPhone LT, cable, & specials on Prodigy & CompuServe .. **$229.**

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10308 US Atlas 34. 3915 Grolier Encyclopedia 225.
★ **Spectrum Holobyte ... 30 day MBG**
1485 Iron Helix ..... 59.
Time Warner
7454 Hell Cab 1.0 *(CD-ROM)* ..... 64.
Wayzata Technology
11605 CD Fun House 25. 10188 Macnificent 7 35.

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★ **Apple Computer ... 30 day MBG**
7073 Mac PC Exchg. 59. 7102 AppleShare 969.
7101 AppleTalk Remote Access ..... 149.
Asanté Technologies, Inc.
Asanté Lite Ethernet Cards ..... *ea.* 125.
2775 10/T Hub-8 249. 2772 10/T Hub-12 499.
BOCA Research
11052 M144I V.32bis FaxModem ..... 189.
★ **Cardinal Technologies ... 30 day MBG**
7670 MVP24MAC 59. 11621 MVP96MAC 169.
11698 MVP144MAC with FAX ..... 189.
★ **CE Software ... 60 day MBG**
8066 QuickMail *(5 user)* 279. 8067 *(10)* 399.
Coactive
1184 Mac Connector ..... 29.
1189 Coactive Connection Mac to PC ..... 179.
★ **CompuServe ... 60 day MBG**
1676 Membership Kit 25. 1673 Navigator 3.2 49.
★ **DataViz ... 60 day MBG**
1823 MacLink Plus/PC 129. 4842 Translators 109.
★ **Dayna ... 60 day MBG**
11878 DOS Mounter Plus ..... 54.
12041 Safe Deposit Personal ..... 59.
DaynaPORT E: *(BNC or 10 BASE-T) ea.* 149.
8719 EtherPrint or 9888 *(10BASE-T)* ..... *ea.* 339.
★ **Dove Computer ... 30 day MBG**
6758 DoveFax 2.. 119. 9634 DoveFax+V.. 189.
12453 DoveFax 144E.. 239. 10200 Pro+V.. 399.
★ **Farallon Computing ... 30 day MBG**
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4869 PhoneNET Connector 10-Pk *(DIN8)* ... 195.
4802 PhoneNET StarController 357 ..... 899.
9805 Timbuktu 5.0 or 4866 Remote 3.0.. *ea.* 129.
9516 PowerPath.. 105. 9518 LocalPath.. 139.
★ **Freesoft ... 30 day MBG**
6115 White Knight 11 ..... 85.
★ **Global Village ... 30 day MBG**
2175 TelePort/Silver... 319. 2179 Gold ... 299.
7889 TelePort/Bronze II ..... 95.
3418 GlobalFax Software for PowerBook Duo 79.
Hayes
10822 ACCURA 2400.. 69. 11422 96 Fax .. 209.
11419 ACCURA 144 + Fax 144 ..... 235.
2300 Smartcom II.. 84. 5971 OPTIMA 24.. 119.

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7557 AccessPC $59. 3441 SoftNode 2.0 $89.
4089 SoftPC.. 99. 10553 SoftPC Windows.. 299.
★ **Practical Peripherals ... 30 day MBG**
8063 PM14400FX FaxModem 419. 11045 MT 229.
★ **Prometheus ... 30 day MBG**
4724 Home Office.... 185. 8990 Ultima .... 375.
★ **Shiva ... 30 day MBG**
3444 NetSerial 1.35 275. 6555 LanRover/L 599.
LANRover/4E for ARA or Netware *ea.* 1699.
LANRover/8E for ARA or Netware *ea.* 2549.
NetModem/E *(thick, thin, 10BASE-T) ea.* 1479.
★ **Software Ventures ... 30 day MBG**
1964 MicroPhone II... 139. 3455 Pro..... 209.
★ **Sophisticated Circuits ... 30 day MBG**
10172 Desktop Dialer ..... 47.
★ **STF Technologies ... 30 day MBG**
7644 FaxManager Plus... 74. 7638 LC..... 25.
Supra
11223 SupraFAXModem V.32bis 14400 ..... 285.
5337 SupraFAXModem 14400LC ..... 185.
★ **Synergy ... 30 day MBG**
6618 VersaTerm 5.0 109. 6619 PRO 5.0 169.
U.S. Robotics
11842 Sportster *(14.4)* Mac & Fax ..... 229.
★ **Zoom Telephonics ... 30 day MBG**
7757 Fax/Modem AFX 74. 3553 VFX V.32bis 209.
7917 Pocket Fax/Modem ..... 99.
3576 FX9624V Send/receive V.42 Fax/Modem 119.

MicroMat Computer Systems
2998 *Drive Tech*—New floppy drive testing and maintenance program! It checks every track and sector position. Unique interface, making cleaning, checking and repairing easy .... **$41.**
3732 *MacEKG II* ..... **89.**

★**CheckMark Software ... 60 day MBG**
5863 *MultiLedger 3.0*—Easy-to-use, integrated accounting software selected as a *Macworld* Editors' Choice *(11/92)* ..... **$225.**
5862 *Payroll 5.1*—Complete payroll management which also works with M.Y.O.B .. **169.**

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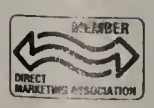

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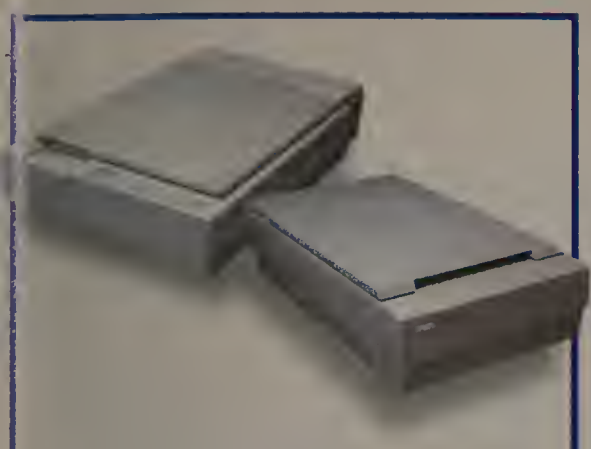
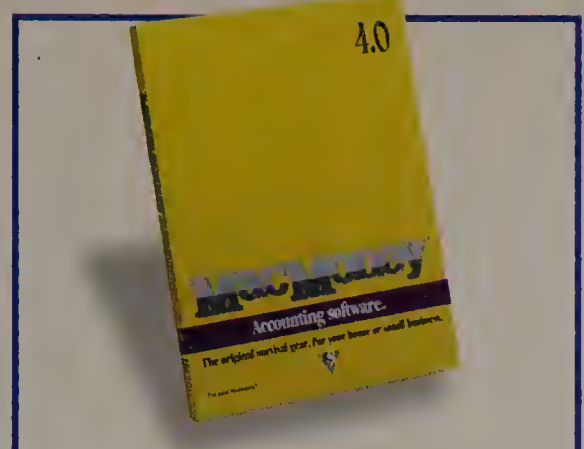


Epson
8219 *ES-800C Pro Mac*—Everything for the pro. Incl. Photoshop 2.5, Scantastic PIM & DA, Kai's Power Tools, and cable..... **$1399.**
8194 *Action Scanning System*—Incl. Photoshop 2.5 LE, Scantastic PIM & DA, and cable.. **899.**



★Survivor Software Ltd. ... 30 day MBG
8093 *MacMoney 4.0*—The new version of the award winning personal and small business accounting program has MORE! More categories (including subs), more splits, more reports, etc. ..... **$55.**

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9830 MAC101E 129. 2384 w/QuickKeys 159.
Dataproducts
10318 LZR 960.. 1099. 10319 LZR 965.. 1899.
Epson
8194 Action Scanning Sys. *(ES-600C SCSI)* 899.
12676 ES-800C Scan. 1199. 8219 Pro Mac 1399.
3052 Interface Kit for ES-600C or ES-800C.. 325.
★ GDT Softworks ... 30 day MBG
2499 PowerPrint 94. 12717 PowerPrint NW 319.
Hewlett-Packard
8368 LaserJet 4M 2199. 7970 Toner Cart. 109.
7665 HP DeskWriter 550C ..... 669.
★ Kensington ... 30 day MBG
2547 Turbo Mouse 4.0 ADB ..... 107.
Key Tronics
6974 Mac Pro + Kybrd. 135. 1070 TrakPro 219.
★ Logitech ... 30 day MBG
1671 MouseMan... 77. 1672 TrackMan ..... 55.
★ Microtek Labs, Inc. ... 30 day MBG
5438 ScanMaker II w/Adobe Photoshop LE. 899.
5441 ScanMaker IIxe w/Photoshop *(full pkg.)* 1199.
★ Mouse Systems ... 30 day MBG
7520 Little Mouse ADB or 8001 Plus ..... *ea.* 68.
9471 A^3 Mouse ..... 74.
NEC
2933 SilentWriter Model 95 with Fax ..... 1199.
★ Sophisticated Circuits ... 30 day MBG
8009 PowerKey 2.01. 75. 8008 Remote ..... 32.

Thunderware
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★ WACOM ... 30 day MBG
11259 The ArtZ *(6" x 8" Graphics Tablet)* ..... 325.

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10282 TransWarp 4300 *(40 MHz, no FPU)*.... 389.
★ DayStar Digital ... 30 day MBG
1613 FastCache 040 *(Quadra 700 or 900)* .. 259.
11987 FastCache 040 *(Quadra 700, 800, 900, 950)* 359.
1312 Turbo 040i 20 MHz 719. 1302 33 MHz 899.
PowerCache for SE/30, II, IIx, IIcx, IIci, IIsi, LC 40 MHz ..... 539. 50 MHz..... 679.
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12011 PH 525 1175. 7991 hammer1000FMF 1549.
IOMEGA
6499 90 MB Transportable *(reqs. interface)*. 659.
2467 90 MB Gold Std. Rem. Cart. *(Qty. 3)*... 349.
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10499 Transportable MultiDisk 150 ..... 699.
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MDS 88... *ea.* 489. MDS 88c... *ea.* 539.
11881 MDS 120 MB Fixed Drive *(zero footprint)* 319.
11880 210 MB..... 439. 11863 540 MB ..... 999.
11963 MDS 120 MB Fixed Drive *(upright)* ..... 349.
11962 210 *(upright)* 469. 11961 540 *(upright)* 999.
Mobius Technologies, Inc.
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8030 Speedster 25MHz without FPU ..... 599.
Peripheral Land, Inc. (PLI)
8327 Infinity 40 Turbo 459. 11470 88/RW 44 625.
2864 PLI Infinity Floptical Drive *(21 MB)*..... 399.
2865 Floptical Cart. *(21 MB)* 25. 2899 *(10 pk.)* 230.

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LaserWriter Toners: Personal 65. LW II 85.
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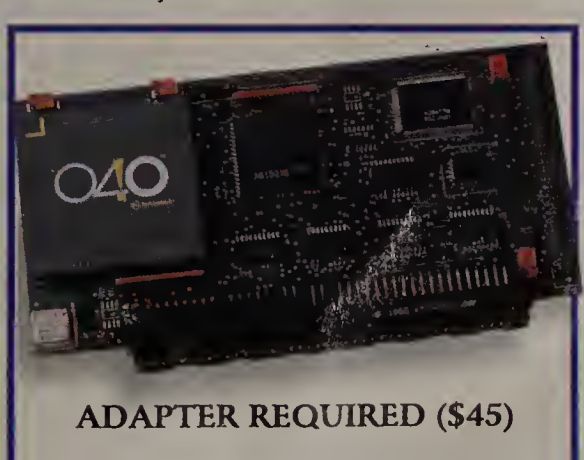

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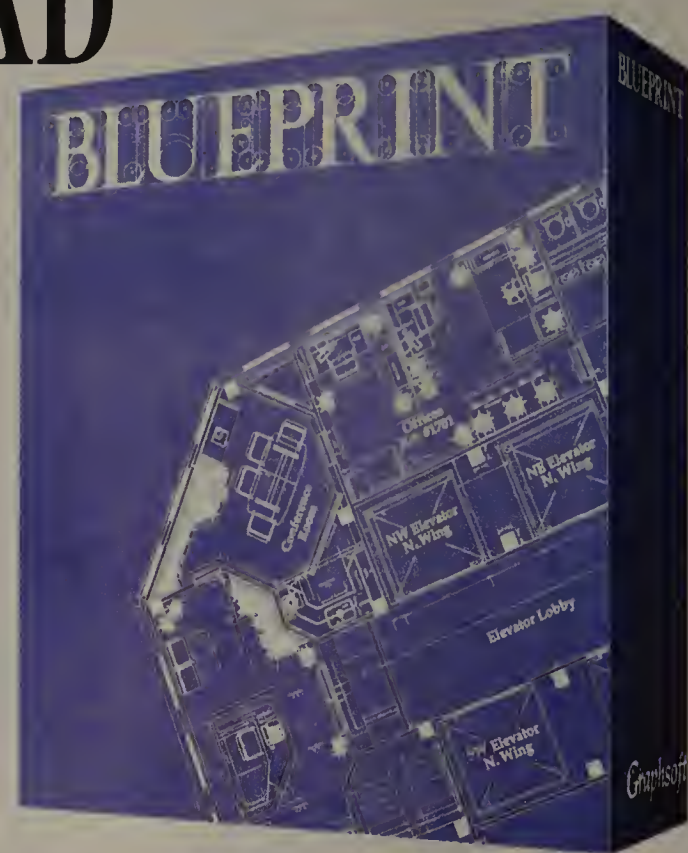

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- ☐ Smart Cursor for locating snaps
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- ☐ chamfers
- ☐ tolerancing
- ☐ unlimited saved views
- ☐ hatching
- ☐ polylines
- ☐ classes
- ☐ export EPSF
- ☐ free Claris CAD translator
- ☐ round wall caps
- ☐ edit inside groups
- ☐ scale by layer

3D CAD:

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- ☐ work in wire-frame or solid
- ☐ walkthrough and flyover tool
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- ☐ roof & slab tools
- ☐ 3D smart cursor
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- ☐ familiar spreadsheet interface
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- ☐ generate drawings automatically
- ☐ perform engineering analysis
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Claris CAD $ 899.00

2D CAD:

- ☐ smart walls
- ☐ Graphic Guide for locating snaps
- ☐ advanced auto-dimensioning
- ☐ editable line styles
- ☐ pan by scroll bars
- ☐ color by object only
- ☐ DXF translator - extra charge
- ☐ unlimited layers
- ☐ fillets
- ☐ editable fills
- ☐ beziers
- ☐ wall-join
- ☐ chamfers
- ☐ tolerancing
- ☐ 9 saved views
- ☐ hatching

3D CAD:

none

Integrated Database/Spreadsheet:

none

Programmability:

none

Blueprint 4 $ 295.00

2D CAD:

- ☐ smart walls
- ☐ Smart Cursor for locating snaps
- ☐ advanced auto-dimensioning
- ☐ editable line styles
- ☐ pan by scroll bars or hand
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- ☐ polylines
- ☐ unlimited drawing space
- ☐ file compatible with MiniCad+
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- ☐ hierarchical symbol library
- ☐ add & subtract surfaces
- ☐ pick-up and put-down attributes
- ☐ fillets
- ☐ editable fills
- ☐ beziers
- ☐ wall-join
- ☐ chamfers
- ☐ tolerancing
- ☐ unlimited saved views
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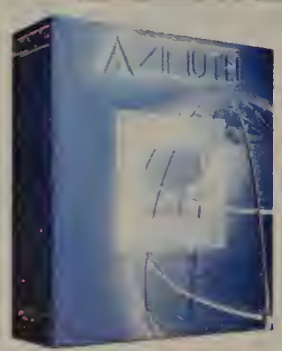

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Circle 46 on reader service card

Thunder 7 1.5.3

Writing Aid

PROS: Works with all applications; corrects interactively; multiple dictionaries; user-definable commands; fixes typos and expands shorthand; thesaurus contains definitions; selection modules provide useful text manipulations. **CONS:** No installation utility; cumbersome activation process; confusing command names; Ghostwriter only somewhat useful; dictionary needs improvement. **COMPANY:** Baseline Publishing (901/682-9676). **LIST PRICE:** $99.95; optional dictionaries $19.95.

MW ★★★★

THUNDER 7 IS THE PREMIER STAND-alone spelling checker and thesaurus that works with virtually all applications and desk accessories. Unlike traditional spelling checkers (such as the one built into Microsoft Word), which analyze documents only when manually invoked, Thunder 7 interactively monitors keystrokes and alerts you to potential errors as they are entered, even correcting them automatically if you prefer.

Installing Thunder 7 is a bit tricky. The package consists of a control panel, 29 compatibility modules, a dozen selection modules, and reference sources, all of which takes over 1.5MB of disk space. You can use the small dictionary with approximately 50,000 words, or the large one with roughly 86,000 words. Additional scientific/engineering, legal, and medical dictionaries are available. With so many optional files to be stored in various locations, an intelligent Installer utility is sorely needed. Baseline also needs to automate the process of initially activating Thunder 7 for use with individual applications and desk accessories. When Thunder 7 is active, a check mark or thunderbolt appears at the right end of the menu bar.

In interactive mode, Thunder 7 analyzes keystrokes for misspellings, duplicate words, and incorrect capitalization and punctuation. If it suspects an error, Thunder 7 plays a user-defined distinctive tone or sound effect. You can either ignore the "error," backspace to fix it manually, or request suggested alternatives in a dialog box. Double-click on the replacement or press the corresponding number of the suggested word, and Thunder 7 fixes the mistake.

If Thunder 7 fails to present an acceptable suggestion, enter your own and verify it before replacing. If you know a word is correct even though it doesn't appear in any of Thunder 7's dictionaries, you can add it to a dictionary, specifying appropriate capitalization and suffixes. Or you can add it to a glossary, and the next time you type that word, Thunder 7 magically replaces it as you type. Expanding shorthand notations, such as replacing *adr* with your full name and address, is another great use for glossaries.

Thunder 7 also has a traditional document mode that checks selections of existing text, highlighting suspect words in a dialog box. A Statistics option analyzes the selection and calculates Gunning's Fog and Flesch's reading-level indexes, as well as the number of characters, words, syllables, sentences, and paragraphs. After checking the entire selection, you can paste the corrected text back into the original document, keeping all graphics, styles, and formats for all programs that use the standard Clipboard.

Thunder 7 comes with a Merriam-Webster thesaurus containing 40,000 unique entry points with definitions, synonyms, and antonyms, plus compared, related, and contrasted words. You can search for just the right word by delving into the related words, or simply replace the word in the document with the one you double-click.

Thunder 7 1.5.3 sports an improved interface and a host of new writing aids. You can convert between straight and curly quotes, change capitalization, and replace tabs with spaces (and vice versa). I find these particularly helpful for use with telecommunications packages that deal with unformatted ASCII text. There's even a search-and-replace module for making multiple changes. The only complaints I have with the selection modules is that their names are somewhat confusing and they aren't grouped logically in the pop-up menu.

Also new to Thunder 7 is Ghostwriter, which saves all keystrokes to a text file during idle time or after a certain number of keystrokes. Ghostwriter saves typed text only, not formatting, graphics, keyboard shortcuts, or mouse movements. As a result, reconstructing heavily edited documents after a crash or power failure can be time-consuming, but at least the fragments of your document are available to jog your memory.

I wholeheartedly recommend Thunder 7 to all users. It quickly and transparently prevents you from making embarrassing typos. And even though the integrity of the dictionary remains the program's primary weakness, Baseline has streamlined the interface and added enough new features to make it a worthwhile upgrade for existing Thunder 7 users.—OWEN W. LINZMAYER

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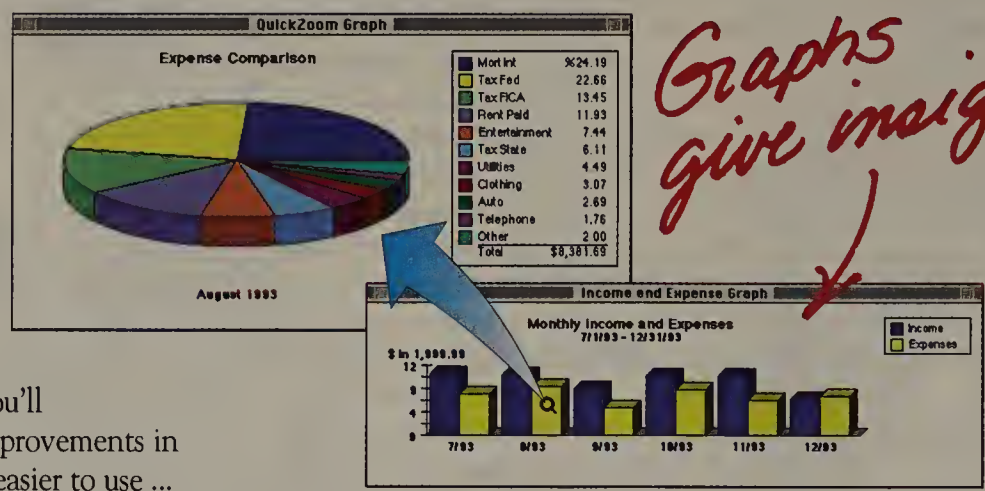
Circle 72 on reader service card

New Quicken 4 will radically improve your financial organization in minutes.

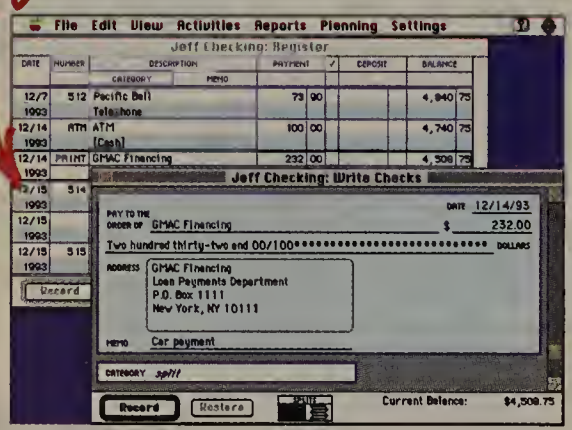
There are over 4 million people managing their finances ... tracking their investments ... even running their small businesses with Quicken. So we knew an upgrade would have to be good. Really good. That's why you'll find over 100 important improvements in Quicken 4. Now it's even easier to use ... saves you more time ... and does much more. And it's still one of the best bargains for your Mac.



Graphs give insight

QuickZoom™ shows you the numbers behind the numbers — from a spending category to an individual transaction — with just a double-click of your mouse.

As easy as your checkbook



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If you can use a checkbook, Quicken 4 is a no-brainer — you can use Quicken 4 without ever opening a manual. And because Quicken 4 categorizes all your spending — and income — you'll see at a glance where your money goes.

Quicken 4 saves you more time

Now you can take care of your bills in a fraction of the time it takes by hand. With QuickFill,™ you'll never have to type the same transaction (like your monthly loan payments) twice. Quicken even enters regular payments and deposits for you — so you get up-to-date, organized records of recurring transactions effortlessly.

Quicken 4 does more

Quicken 4 makes even complex financial situations simple. It now tracks investments with ease. Calculates loan amortization with variable interest rates. Performs "what-if?" calculations for powerful financial planning. It even provides your Quicken Visa® card statement electronically. So you always have a complete financial picture at your fingertips.

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Quicken 4 also gives you new insight into your finances. Vivid 3-D graphs make it easy to monitor your spending patterns more accurately. And

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Quicken 4 means business

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Connectix Desktop Utilities 1.0

Desktop Utility Package

PROS: Combines several useful functions in one package; accommodates multiple users; good value. **CONS:** Creating synchronization scripts is confusing; security is easily circumvented. **COMPANY:** Connectix Corporation (415/571-5100). **LIST PRICE:** $99.

MW ★★★

CONNECTIX DESKTOP UTILITIES (CDU) consists of 16 general-purpose System 7 utilities and is the desktop-Mac equivalent of the popular Connectix PowerBook Utilities (CPU). Although CDU is not in the same league as heavyweights like Now Utilities, CDU offers several popular power-user features in one integrated package and includes a powerful file-synchronization utility.

You install CDU as a single control panel and configure all of its functions, except file synchronization, from the control panel interface. After installation, CDU displays the CDU menu and the EasySync menu in the menu bar. The CDU menu can be configured to display the current date, time, and the amount of free space on a selected hard drive. You can set CDU to continuously display only one of these items or to cycle through each item at a specified interval. The CDU menu is also a shortcut to the CDU control panel and other standard Mac-configuration options such as sound level, color depth, and Chooser device. If your machine has a color monitor, you can dress up the desktop, menus, and menu bars with one of CDU's snazzy color-coordinated menu/desktop patterns.

The CDU control panel interface consists of a QuickConfigure mode with check boxes for quickly enabling and disabling CDU's major features, and a Fine-Tune mode for more detailed settings. The Fine-Tune mode sports an interface similar to System 6's Control Panel, with a scrolling list of available items on the left and the configuration options for the selected item on the right.

CDU also contains a no-frills screen saver, options to hide the balloon-help menu and background application windows, and a disk-activity indicator. The Hot Keys feature is a decent low-level macro program and comes with predefined key combinations for certain CDU functions. You can also assign your own hot keys. The Cursor feature, not usually of much value on a desktop machine, locates a lost cursor by flashing a 1-inch dot around it and can display the I-beam cursor in three thickness levels and an hourglass shape.

If you're a Windows fan or are partial to using keyboard shortcuts, the Keyboard Power feature will be welcome. This utility enables you to control menus and dialog boxes by typing the letter that CDU underlines in a control word (such as a menu name) in conjunction with the modifier key of your choosing. Keyboard Power can also be configured to have menus drop down when you click on or point to the menu title.

With the security feature enabled, CDU requests a password at start-up or after the Mac wakes from sleep mode. (Desktop machines don't have sleep modes—further evidence that CDU is a revamped CPU.) Or, you can require a user to click on a portion of a graphic along with a key combination as a password. Both of these security features are easily circumvented by starting up with a floppy and then tossing the CDU Prefs file. But if cheap-and-easy security is what you're after, CDU's got it.

The EasySync menu, which appears as an icon in the menu bar, is for configuring CDU's synchronization features. (Why EasySync is in its own menu and not in the CDU menu remains a mystery.) EasySync modifies the Finder's copy status window to include Sync and Merge buttons. When you drag an item from one volume to another, EasySync either synchronizes the source and destination folders so that both folders are updated, or merges the changed items from the source folder into the destination folder. I found the EasySync feature the most useful. EasySync also lets you create *synclets*, graphic representations of scripts to perform repetitive synchronization and/or merge operations. The steps to create a synclet are a little confusing; it took a couple of tries before I got the process correct.

All CDU options can be placed into sets, which comes in handy if your Mac doubles as a luggable from office to home, or if several coworkers or family members use one Mac. You can either create new sets or use the CDU defaults.

Although some of CDU's features are more at home on a PowerBook, and others are available as parts of other packages, CDU offers the advantage of one-stop shopping at a low price. With street prices in the $50 to $60 range, Connectix Desktop Utilities is worth the price just for the file-synchronization, Keyboard Power, and Hot Keys features.

—GARY T. KRATZER

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Circle 23 on reader service card

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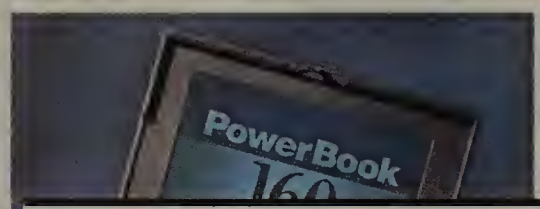

"...just one short-cut on your Word video saved me 20 minutes of set-up time, not to mention frustration..."

Harland Anderson - Computer Consultant

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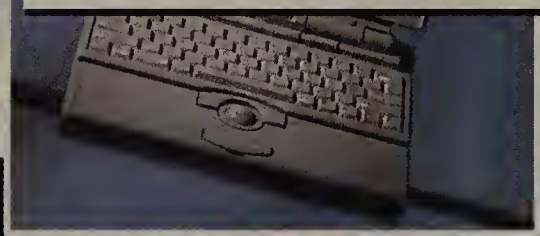
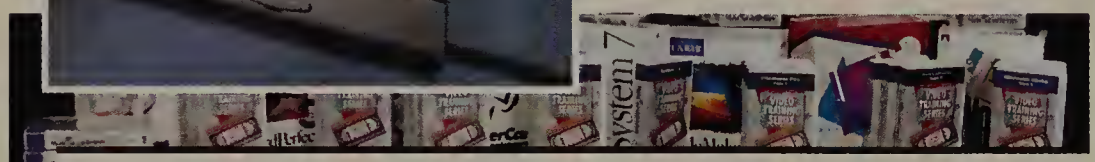


"As a result of your videos my Mac is running lean and mean..."

J. J. Johnson - San Jose, CA



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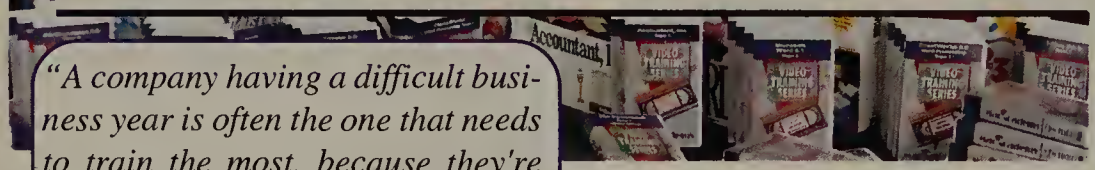

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Astound 1.0

Multimedia Presentation Software

PROS: Large assortment of templates and presentation support elements. **CONS:** Minor glitches in player; tutorial and manual need work. **COMPANY:** Gold Disk (408/982-0200). **LIST PRICE:** $399.

MW ★★★★

IF YOU PURCHASED ASTOUND FOR $99 in its introduction this past spring, you got a bargain. Even at $399, it's an impressive value. Astound is essentially a competitor of Microsoft PowerPoint and Aldus Persuasion; it also lets you include sound, text and graphics animation, and multicolor gradient backgrounds as presentation elements, with no more effort than pasting in a chart in other products.

Astound has more than 30 templates, optimized for different monitor sizes (including PowerBook screen size), transparencies, and slides. *Templates* is rather a tame word for these screens, somehow implying a static format. In fact many of the templates demonstrate animation effects—you can enter your presentation title into a title bar without realizing the letters will appear to drop from space when you actually show the presentation on a Mac. Similarly, you can show bar charts actively growing, display little animations that fly across the screen at selected intervals, coordinate this visual circus with sound effects, and show a QuickTime movie at the same time, just in case your audience was raised on MTV. You introduce special effects into slides simply by dragging an area onto the screen with the appropriate tool. Once you develop a presentation (a set of Astound computer-based slides), you can distribute it with a stand-alone player on either Macs or Windows PCs (the latter requires some format caution, but it works).

The template set is sufficiently complete that most users will make only a few modifications. Text editing and highlighting are easy, and Astound includes an outliner, a slide-manager function, and a spelling checker. You can specify any level of playback interactivity, from hands-off automated run-through, to a pause-and-annotate mode of delivery. Against these virtues, one complaint about Astound is that neither the tutorial nor the manual are detailed enough (I still don't understand several problems I had with imported graphics, even though I have now fixed them).

For the record, I actively despise most multimedia products, mainly because I think that the message gets lost in special effects. But Astound makes it so easy to introduce "wake-up" elements into a slide show that you can use them sparingly and effectively, and you don't invest so much time in learning Astound that you feel obliged to call out pyrotechnics on every slide. I used Astound for a last-minute real-life presentation and startled a quite sophisticated audience. Although it's perfectly competent at producing standard slides to be processed at a service bureau, most of Astound's value lies in its easily accessible sound and animation. I think it's currently the best value in Mac presentation software.
—CHARLES SEITER

Doesn't Take Einstein Although Einstein is included in Astound's huge clip art library, mere mortals will take heart from the program's large assortment of templates and easily accessible multimedia features (the tool palette at left).

Helix Tracker 1.0

Workgroup Document Manager

PROS: Feature-rich, well-designed manager with strong audit and annotation features. **CONS:** Large documents a problem in LocalTalk network. **COMPANY:** Helix Technologies (708/465-0242). **LIST PRICE:** $439 (server and four clients).

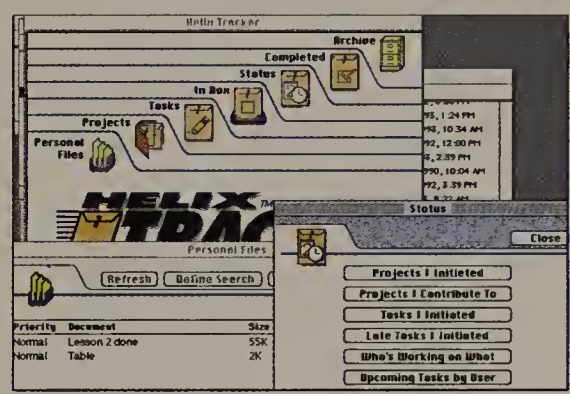
MW ★★★

HELIX TRACKER DRAWS ON HELIX Technologies' long experience in document-management systems (it designed the Odesta Document Management System) and unique software constructs (binary large objects) to provide a solution to the unmanaged clutter of files and paper that the computer has produced in the modern office. Its file-tracking and -annotation system is somewhat reminiscent of the old paper-based document-security system used by intelligence agencies. In that system, every document was archived in a folder with a record-keeping jacket on the outside—every time someone looked at the file, modified it, or commented on it, the action would be noted on the jacket. In Tracker, an administrator assigns files to a small workgroup electronically and tags the files with assignments, due dates, and security levels; the system tracks changes and version history. When a document-based project is finished, the administrator can store it in a protected archive.

Once the administrator plans a project and partitions it among workgroup team members, the team has a relatively easy time. At the client end, users see a screen with stacked folders for personal files, projects, tasks, an in-box for project files, a status folder, a folder for completed work, and an archive. You show up for work, look over projects, status, and tasks, and then open your in-box and start working on documents. In addition to text, a document can be graphics or a spreadsheet or a Mathematica file—a document opens from within Tracker in its native application. After working on a document, you can attach annotations as you send it to the next team member downstream on the work route.

This is a great improvement on the usual unmanaged clutter of files stored on a server. First, workers can find the files they need in their in-boxes, so there's no searching through folders on a huge hard drive. Second, the method of tracking, which coordinates projects through specific assignments with due dates, makes it painfully obvious who's on time and who's not; usually a key management chore in a sequential document project is finding out where the schedule bottlenecks are.

If you are managing a book project in Helix Tracker on an AppleTalk network, you will soon find Ethernet to be mighty attractive. Helix also recommends a 68030 processor or better for both server and clients, and this is no idle suggestion. Helix as a database has speed problems, and you can see some of them in Tracker. But for an advertising agency, or a group handling invoices, or for that matter the *Macworld Reviews* department, Tracker is fast enough and imposes just the right amount of administrative discipline. I'd rather use this product than Lotus Notes (see *Reviews*, September 1993).—CHARLES SEITER



It's Not Over Till It's Documented This screen shows Tracker's system for reporting job status, along with its intuitive folder-based interface for work organization.

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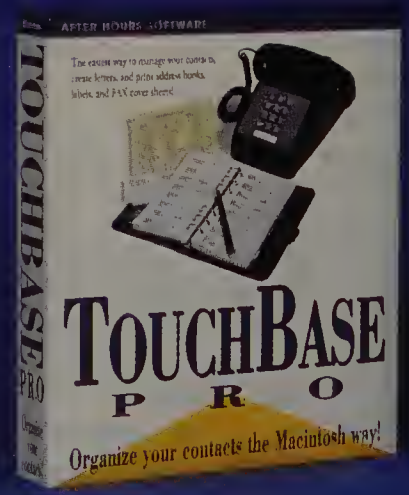

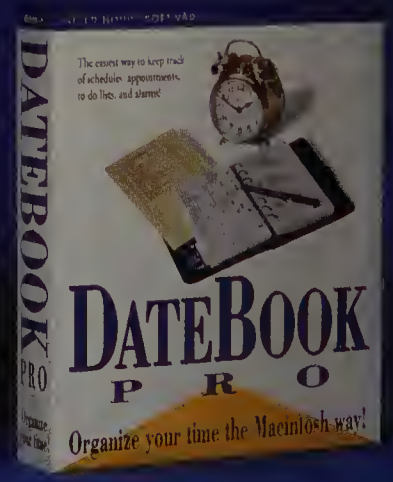

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DriveShare 1.03

Removable-Drive–Sharing Software

PROS: Simple, convenient method for sharing devices over an AppleTalk network; faster data transfer than System 7 file sharing. **CONS:** Device is accessible to only one user at a time. **COMPANY:** Casa Blanca Works (415/461-2227). **LIST PRICE:** Five users $149.95; ten users $199.95.

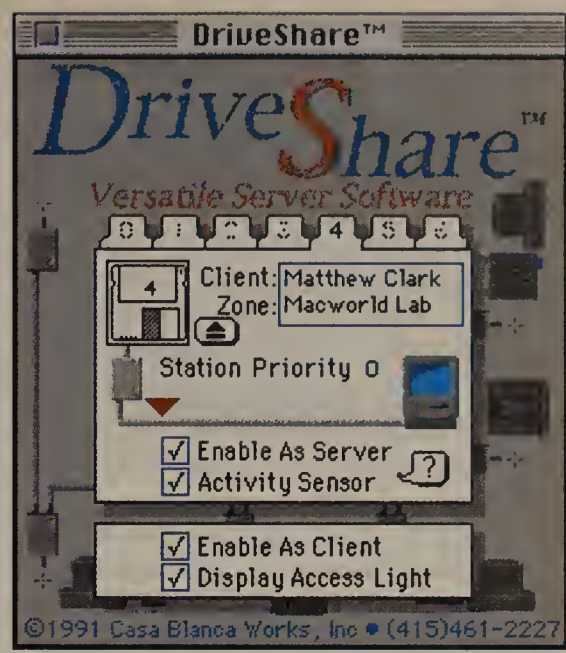
MW ★★★

SHARING IS ONE OF THOSE HIGH-CONcept things we learn as kids. Share your toys, share your ice cream, share your tiddlywinks. DriveShare from Casa Blanca Works brings this concept into the workplace by giving up to ten users easy access to one removable device (SyQuest, Bernoulli, optical, CD-ROM). The device is located at the workstation of an administrator, who decides who will have access.

DriveShare consists of two control panels. The first, Drive7rem, is a SCSI device driver that enables you to mount virtually any removable device. With it you can also mount and remove media while the system is still on. (Most removable drives come with a control panel that does the same thing; you should remove it from your system to prevent conflicts.) The second control panel is DriveShare, the control center where you designate the users who will have access to the DriveShare device.

Installing DriveShare is simple. If you are the administrator, drag the Drive7rem and DriveShare control panels to your System Folder. Do the same on the systems of other deserving souls. Now the removable-device power brokering can begin. Whenever you insert removable media, you are asked to identify a target user (that is, anyone with the DriveShare control panel installed). Once you select a user, the volume mounts on that person's desktop and remains his or hers until he or she drags the volume to the Trash, or the administrator dismounts the volume remotely.

I doubted this would benefit anyone working under System 7, which provides file-sharing features that allow more than one person to use any volume simultaneously. I didn't think DriveShare offered any great new feature. But I did discover one advantage: speed. I compared the time it took, using System 7 file sharing and DriveShare, to copy a 1MB folder. The DriveShare process took only 28 seconds to transfer the folder, while the System 7 file-sharing process took nearly twice as long, 54 seconds. Also, DriveShare is easier to use than System 7 file sharing. Still, DriveShare lacks security features, such as password protection of volumes or folders.



Complete Control The control panel includes the ability to dismount the drive remotely. Beware the administrator on a bad day.

DriveShare is most useful if your network consists of users on both System 6 and System 7. I'm hesitant to recommend implementing it if you only need to share devices among System 7 users: the only real advantage is transfer speed. DriveShare's ease of use, especially for the price, doesn't provide much benefit over System 7.
—MATTHEW CLARK

SupraFaxModem 144PB

PowerBook Fax Modem

PROS: Caller ID (requires local phone-company support); fast installation; communications and fax software included. **CONS:** Some problems with high-speed file transfers; communications software lacks scripting; awkward fax software; errors in instruction manual; lacks on-screen activity display. **COMPANY:** Supra Corporation (503/967-2400). **LIST PRICE:** $349.95.

MW ★★★

THE SUPRAFAXMODEM 144PB IS ABOUT the length and width of a credit card, approximately a third of an inch thick, and can be installed in PowerBook models 100 through 180. The 144PB supports the entire suite of data-modem speeds from 300 bps through 14,400 bps, and automatically configures itself to the speed of the connecting modem. It offers V.42bis data compression, which promises (but cannot quite deliver) throughput of up to 57,600 bps on uncompressed-file transfers. Fax throughput ranges from 2400 bps to 14,400 bps—but you need an equally capable fax modem at the receiving end to support that speed. (Stand-alone fax machines generally operate at speeds up to 9600 bps.) The 144PB comes with communications software (MicroPhone Light and CompuServe Information Manager) and fax software (Faxstf).

Installing the modem isn't difficult, but if your PowerBook is still under warranty, have a dealer do it. In a quick survey of a few dealers across the United States, price quotes ranged from $25 to $50 for the job. The installation should take about 15 minutes from start to finish. Ignore the illustration in the manual, though—Supra shows the modem seated backward, with the RJ-11 modular phone jack facing the inside of the PowerBook rather than the rear.

MicroPhone Light is almost identical to MicroPhone Pro but lacks scripting capability (see *Reviews*, April 1993). It's fast, flexible, and easy to set up, and it includes automated settings for some online services, such as CompuServe and GEnie.

Faxstf is packaged with a number of fax modems, but it hasn't had any major updates in a while, and the interface needs some work. While you can receive a fax automatically, to view or print the fax you have to open the FaxManager application, and then open the fax file (which resides in a FaxSpool folder inside the System Folder). In its finished form, the fax consists of an image file that cannot be edited, but STF Technologies will sell you FaxManager Plus, which includes OCR capability, to convert the fax file to editable text. Although Faxstf supports both PostScript (with ATM) and TrueType fonts, PostScript graphics show up only as bitmapped PICT representations.

The modem works speedily and efficiently, but I had a few problems with high-speed file transfers when Faxstf was active. Disabling the fax software seemed to improve the file transfers somewhat. I never had any problems actually connecting to my favorite online haunts, however.

Although the modem provides a range of volume settings (unlike other modems, which have either way-too-loud or off speaker settings), I did wish for some on-screen indication of modem activity. I was not able to test the modem's Silent Answer feature, which allows you to receive both fax and voice calls on a single line, because Faxstf simply doesn't support this feature yet. Caller ID works only if your local telephone company offers the service (an optional extra).

The 144PB worked reasonably well in my installation. If you are looking for a high-speed internal modem for your PowerBook and want to save a few bucks, the SupraFaxModem 144PB is definitely worth your consideration.—GENE STEINBERG

PerFit Port-A-Com

Portable High-Speed Modem

PROS: ADB-powered; compact size; 14.4-Kbps fax/data speeds; reliable operation. **CONS:** Poor documentation; short power cable; no voice/data switch; limited status lights. **COMPANY:** PerFit (303/530-7333). **LIST PRICE:** $349.

MW ★★★

WHILE INTERNAL POWERBOOK modems are all the rage today, users with both a PowerBook and a desktop Mac may find sharing an external, portable modem a better use of their money. The PerFit Port-A-Com fills that bill, providing a compact, ADB-powered, high-speed fax/data modem for about half the price of two specialized modems.

The package consists of a SpectraCom modem that's been modified to use the Mac's ADB connector for power instead of a battery pack, as well as cables, a cloth case, Faxstf and MicroPhone LT software, a quick-start guide, and separate manuals for data and fax. The modem is a black plastic disk 4 inches in diameter and about an inch thick, weighing practically nothing. You plug the modem's 5-inch power cord into the Mac ADB port and a longer serial cable into a serial port. The ADB cable has a piggyback connector, and the modem includes both line and phone jacks.

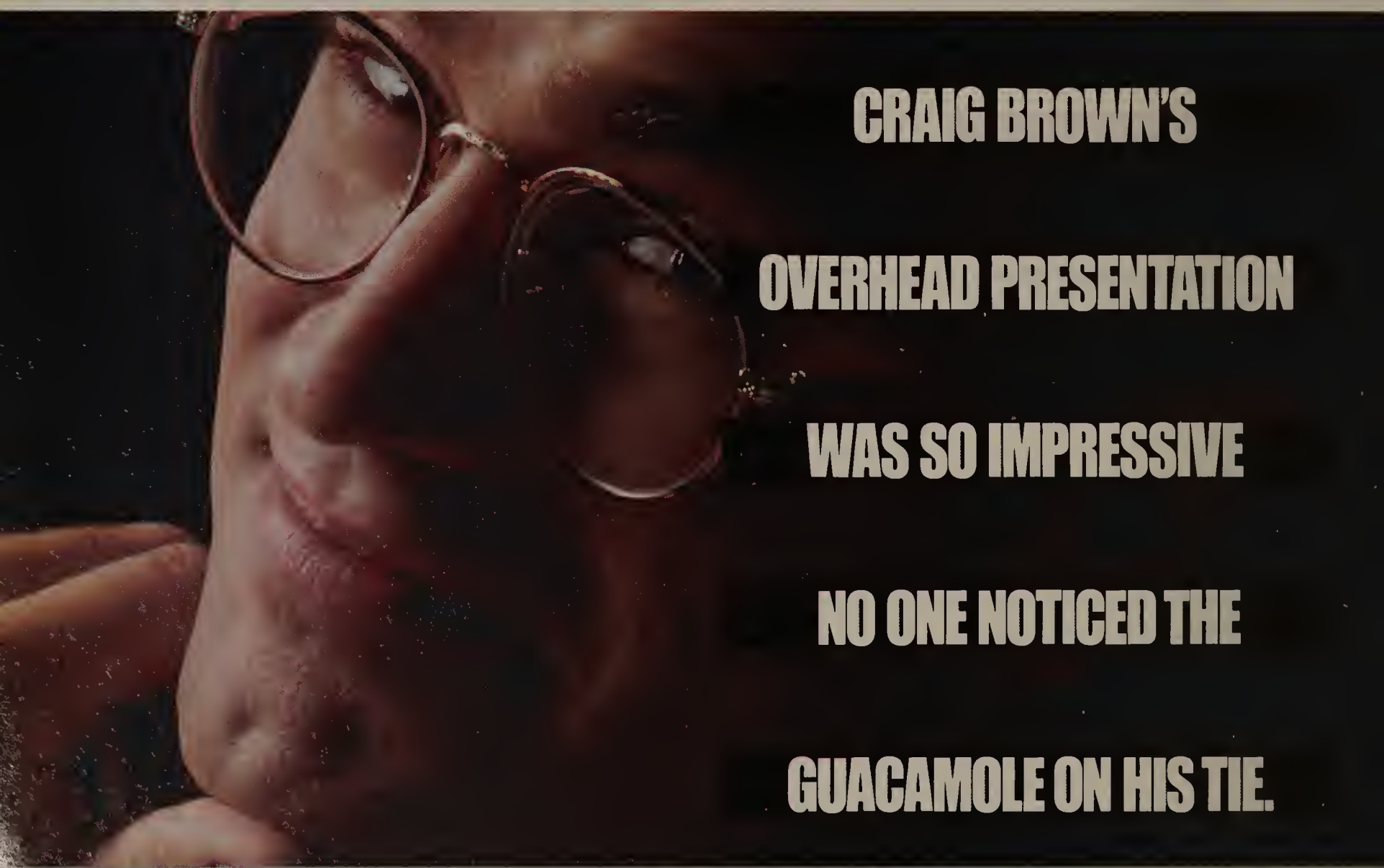
The modem's data mode supports speeds up to 14.4 Kbps, automatic fallback, V.42 error correction, and V.42bis MNP Class 5 compression. The features noticeably missing for a modem billed as desktop-capable are full status lights—you get only power, transmit, receive, and carrier detect—and automatic voice/fax switching. Most users find indicators for autoanswer, speed, and off-hook status extremely useful. Users without a dedicated fax line may need an external voice/fax switch—an expense that kills some of the savings achieved by sharing a single modem. The nonremovable ADB power cord is another problem—it's too short to bring the modem out from behind the PowerBook's screen, forcing you to peer around back to check status lights. With desktop Macs, the modem is completely hidden.

Tests with online services and fax machines showed the modem both capable and reliable, able to achieve its rated speeds even on noisy phone lines. At 0.9 watts, its power requirements are only slightly more than the 0.7w typical of internal modems.

Achieving a working connection required tinkering with the modem's configuration, a frustrating process due to the Spartan and poorly organized documentation. The Port-A-Com is a repackaged PC-market SpectraCom modem; SpectraCom's manual is a 25-page pamphlet with very little detail on configuring beyond a list of AT commands, and no Mac particulars at all. PerFit's quick-start sheet explains ADB installation but also says nothing about Mac settings. It turns out that the modem's default configuration specifies PC-style hardware handshaking, while Macs traditionally use software handshaking. Other parameters that require fiddling are compression and speed negotiation. In contrast, the included Faxstf fax software is well documented, and it worked, without changes, right out of the box.

Fortunately, PerFit's excellent telephone support quickly answered all configuration questions. However, the documentation directs you to call a $1.25-per-minute 900 number for support; given PerFit's poor documentation, this hardly seems reasonable. PerFit says users can call its direct line, and that the 900 number is only for post-installation help.

Although there are problems due to PerFit's repackaging, the Port-A-Com is a solid, high-performance modem at a good price. In the Macintosh world, you'll have a hard time finding its particular combination of small packaging and performance elsewhere.—MEL BECKMAN



InStat 2.01

Lab-Oriented Statistics Software

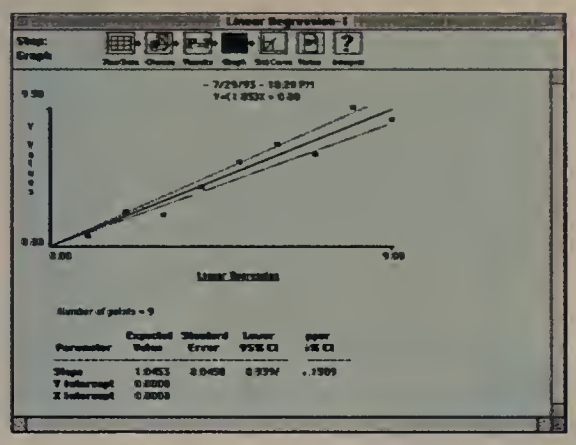
PROS: Good feature assortment for lab analysis; superior help; pop-up stat calculators. **CONS:** Minimal graphics; designed for small data sets. **COMPANY:** GraphPad Software (619/457-3909). **LIST PRICE:** $95.

MW ★★★

IN THE OCTOBER 1993 ISSUE OF *MACworld*, we mentioned InStat in an article about professional statistics packages. It's time to look at InStat for another market: all the professional scientists whose background in statistics is embarrassingly slight. Nonscientists often assume that laboratory researchers must have taken several serious statistics courses somewhere in their education, but it's quite possible to get a degree in chemistry, molecular biology, or physics without even taking first-year statistics. In fact, you're more likely to face a required statistics course as a social-sciences major than as a hard-science student.

InStat, advertised as "Instant Biostatistics," fixes all this. The developer, Harvey Motulsky, has pulled out the most useful tests from a long list of statistical possibilities, and this subset is aimed at analysis of experiments. SYSTAT, for example, can handle data sets with tens of thousands of cases and hundreds of variables; InStat is ready for hundreds of cases and six variables. SYSTAT has every test found in an advanced textbook; InStat has regression, correlation, ANOVA (including repeated measures), and a surprisingly complete assortment of nonparametric tests (Mann-Whitney, Wilcoxon, Kruskal-Wallis, standard t-tests, and six others). SYSTAT can do 3-D graphs in color; InStat makes graphs that belong in your lab notebook (see "Plain Speaking"). But SYSTAT assumes you know what you're doing, and InStat doesn't. Amazingly detailed help screens are just supposed to refresh your memory but in fact will teach you from scratch the theory behind each test and help you pick one that's appropriate for your data. When you've picked the test, InStat also explains the results. One wonders why, in the 10MB to 20MB of hard disk space the big-time statistics packages require, no other vendor has seen fit to offer this amount of compassion to semiliterates in statistics.

The limitations of the program are not much of a problem in its target market—most quick-and-dirty experiments at the lab bench don't have more than a few variables and 50 to 100 data points, and the most worthwhile analyses are typically regression or ANOVA. The spreadsheet-style data table offers 26 columns by 500 rows, probably more space than you'd want to fill with hand-entered data (InStat can also import data saved as text from the usual spreadsheets). The pop-up calculators for P values and significant sample size are not just a nice touch but are helpful in planning experiments. Besides this, the manual is a model of chatty clarity, giving one of the few coherent explanations of the effect of non-Gaussian populations on ANOVA, for example. You'd have to pay more than InStat costs just to take a one-semester statistics course, making this program one of the few bargains in software for scientists.
—CHARLES SEITER



Plain Speaking This InStat data graph is austere, but the text explanation of regression results is admirably complete.

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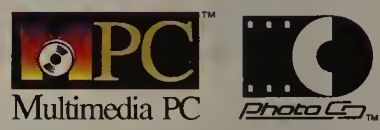

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KUR-0022

Screenscapes 1.0.1

Desktop-Pattern Utility

PROS: Allows you to view multiple patterns simultaneously; great tools for generating new patterns and modifying existing images; rich collection of desktop art. **CONS:** No text or painting tools. **COMPANY:** Kiwi Software (805/685-4031). **LIST PRICE:** $44.95.

MW ★★★★

WITH MORE THAN 600 DESKTOP PATterns—and a suite of well-designed modules to transform those patterns—Screenscapes is a fun and frivolous utility that lifts the art of desktop-pattern design to new heights of elegance.

Screenscapes is not a control panel, nor does it modify the System file. A standalone application, Screenscapes copies the desktop pattern you select into RAM. Each time you start the Mac, a tiny companion application, Screenscapes Auto-Changer, launches automatically, reinstalls the pattern into RAM, and quits.

Screenscapes allows you to view several pattern swatches at once. By opening more than one catalog window simultaneously, you can view dozens of patterns at a glance. You can also display the swatches in any of five different sizes, from 16 by 16 pixels to 256 by 256 pixels.

Clicking on a swatch temporarily applies the pattern to the desktop so you can preview a pattern before installing it. Alternatively, you can use the Slide Show feature, which hides Screenscapes' windows and displays patterns on the full screen. Hitting any key stops the show and takes you to that pattern in the catalog window. You select the Install command to install the selected pattern on the desktop.

For variety, you can set Screenscapes to install a new pattern each time you restart the Macintosh—or set the program to switch to a new pattern with each new day, week, or month.

The program comes with a gargantuan collection of desktop patterns. They include an entertaining set of photographic images—wood shavings, seashells, jelly beans, chocolate-chip cookies—that look great on the desktop. Some of the other patterns are less impressive; many sport intriguing names like Mustard Mayhem and Teal Trade-off, but are just subtle variations on a predominant "neon amoeba" theme.

Screenscapes' clever pattern-editing tools let nonartists build and modify patterns. The Shape Organ, for example, allows you to select geometric shapes and colors and then have the program generate a pattern based on these. The Picture Perfect module lets you apply a variety of effects to a piece of clip art. (Unfortunately, you're restricted to the 64 images that come with the program.) There's also a Gradients module and a Random Textures module.

You can adjust the colors in an existing image, altering the hue, saturation, and brightness or the color balance using slider bars in the Color Adjustment module. You'll also find a Dimmer to brighten or darken an existing pattern by up to 25 percent at a time.

If you have custom art you'd like to include in a desktop pattern, the Snapshot command allows you to take a screen shot of any part of your screen and insert the contents into a new pattern.

Surprisingly, the program doesn't provide regular painting tools. Most users probably won't miss them, but Kiwi should have included some way to edit pixels in an image or add text to a pattern.

In the end, you have to ask yourself if this is all worth it. Should you spend $40 (street price) on a product that does absolutely nothing to enhance your productivity? Admittedly, Screenscapes is just a toy—but it's a very good toy.

—JOSEPH SCHORR

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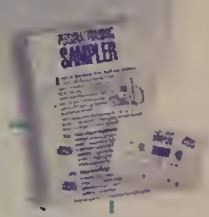

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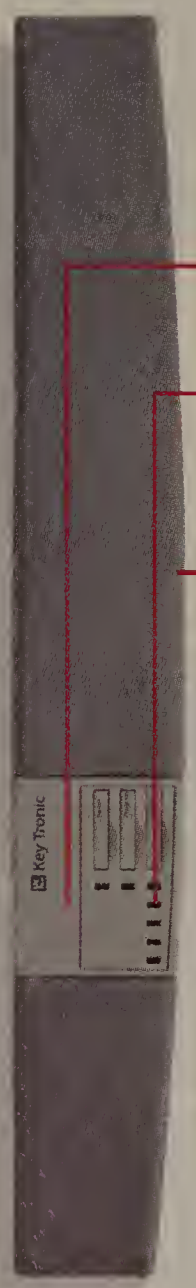
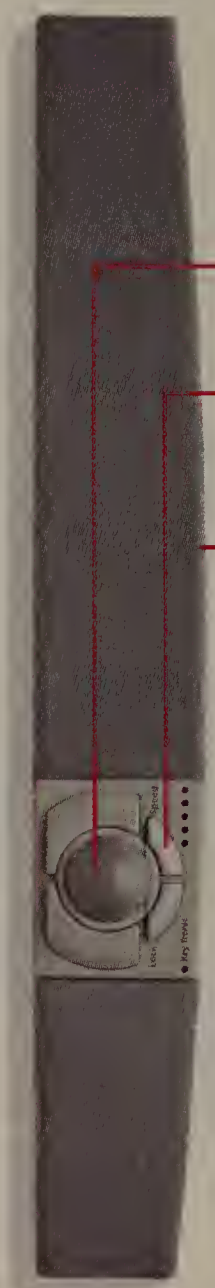
Wrist Management.



The PACEMATE™ Features:

- *Built-in work pace module that monitors keyboard activity*
- *Visual and audible indicators allow user to manage work pace by integrating short breaks*
- *Height adjustable wrist pads for increased comfort*
- *One-year warranty*
- *Key Tronic Quality*



The TRAKMATE™ Features:

- *Trackball integrated into the wrist pad's design*
- *Two extra buttons with corresponding LEDs for trackball speed control and drag lock*
- *Height adjustable wrist pad for increased comfort*
- *One-year warranty*
- *Key Tronic Quality*

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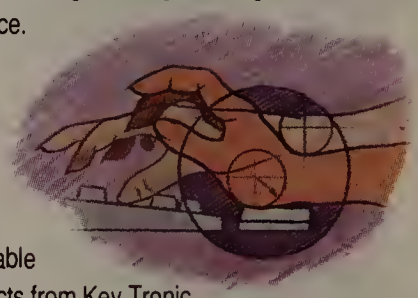

The free-standing adjustable wrist pad products from Key Tronic offer users a comfortable resting surface for wrists and palms. The TRAKMATE™ wrist pad features a powerful trackball unit for quick, easy access to point and click functions. The PACEMATE™ wrist pad features an integrated work pace module that monitors keyboard activity, work periods and rest times.

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Circle 73 on reader service card

ColorUp 1.0

Color Palette Designer/Color Tutorial

PROS: Easy to use; helpful information on color. **CONS:** Limited usefulness; hard to compare palettes and colors; awkward installation. **COMPANY:** Pantone (201/935-5500). **LIST PRICE:** $99.95.

MW ★★

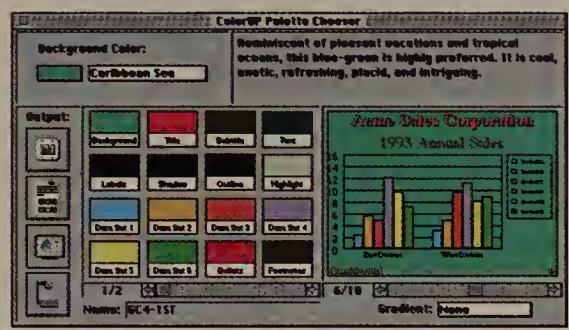
COLORUP IS REALLY TWO PROGRAMS in one package. Palette Chooser helps amateurs produce quality presentations by offering them hundreds of predesigned palettes with colors for backgrounds, text, bullets, and so on. You can use the palettes for reference, or export them for use in Aldus Persuasion, Aldus FreeHand, Adobe Illustrator, Microsoft PowerPoint, and Claris MacDraw Pro. Explorer is an online book about color, with sections on color science, aesthetics, and output options.

When you launch Palette Chooser, it prompts you to select an output medium—35mm slides, paper, computer screen, or overhead projection. Different colors work better in different media (very light backgrounds often project poorly, for example), so the palettes are tuned for the output. Then you choose a background color. An info box displays and describes the current color, explaining, for instance, that yellows are sunny and reds are passionate.

Palette Chooser displays a 16-color palette using your specified background, with companion colors for the other elements. Sample presentations display various combinations of text, graphs, and charts.

You can create custom palettes—and you well may want to. Some of the program's palettes are odd at best. The info box for several of the green backgrounds warns that the color is "tacky, gaudy, loud, ugly, sickening, slimy, and trendy," but attention-getting. Surely no designer should be encouraged to attract that kind of attention.

Palette Chooser is easy to use, but it has some serious deficiencies. When deciding between two palettes, I'd like to be able to switch back and forth to see an immediate comparison. With 8-bit color (though not 24-bit color), every time you make a change, whether it's scrolling to a new palette, picking a new background color, or changing the output medium, Palette Chooser redraws the entire screen, creating some wild color gyrations in the process. Also, the windows containing the custom-color controls almost completely cover the palette.



But Is It Art? Here Palette Chooser displays one of two predesigned palettes available for screen output with the background color Caribbean Sea.

ColorUp Explorer is somewhat better designed. It's easy to go directly to any chapter or section. The information is helpful and easy to read, with lots of illustrations. The best parts of Explorer are the experiments, which give you a hands-on feel for how color works. For instance, one shows you an image in full color; another shows how that image would appear to people with three different kinds of color blindness.

Explorer's main drawback is that it takes up 10MB of disk space. And though Pantone says it "can be easily loaded and unloaded as needed," Explorer has the clumsiest installation procedure I've seen.

Overall, ColorUp's usefulness is limited. Professional graphic designers don't need Pantone's advice about color design. And although nonprofessionals might benefit from ColorUp Explorer's information on color theory, $99.95 is a lot of green to spend on a color tutorial and series of predesigned palettes.—MICHAEL ROSENTHAL

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Sailing Master 1.1

Sailboat-Racing Simulation

PROS: Good tactical and strategic play and practice; variable wind-shifts; implements basic racing rules. **CONS:** Jerky motion; sounds cause momentary pause; can't compete with other people directly; somewhat unstable.
COMPANY: Starboard Software (313/662-4393). **LIST PRICE:** $64.99.

MW ★★★

IF YOU'RE AN OBSESSED SAILBOAT-RACING skipper as I am, or if an afternoon's sail sounds like a pleasant break from your afternoon's work, you should check out Sailing Master 1.1. This program is a fun simulation of sailboat racing, and a good way to learn the wind-shifts at the same time.

You can sail against as many as three boats (with various levels of skill), on Olympic and windward/leeward courses. You can't sail against other humans except by using a Time Trials mode, which ranks subsequent sailors on the same course. Sailing Master handles the basic racing rules, forcing you to do a 720-degree turn, for instance, if you fail to respond to a leeward boat coming up behind you.

The interface is straightforward (see "Racing to Win"). The wind shifts in intensity and direction across the course, with wind-shifts sometimes presaged by dark and light areas on the water upwind.

Sailing Master's Autotrim and Autoheel options handle the sails and the angle of the boat for you, so you can concentrate on strategy and tactics. Once you've used Sailing Master a while, you can control sail trim and heeling angle manually.

A new feature in 1.1—Smart Tiller—adjusts your course to be 45 degrees off the wind (optimum sailing angle) when you point up or down. This makes it much easier to compete with the other racers. There are keyboard shortcuts for controlling direction, but unfortunately, they don't work with Smart Tiller.

Racing to Win Sailing Master's main window shows your boat in relation to competitors and wind direction. A button panel controls direction; numeric readouts inform you of boat and wind speed; a course view shows the whole course; and a stern view depicts heeling angle and sail trim.

Speed is Sailing Master's biggest problem, though it's not a fatal flaw. Motion is jerky even on a Centris 650, unless you turn off sounds (which are essential to notify you of wind-shifts and competitors' tacks, but which cause the program to pause momentarily). Motion is very jerky on a Macintosh SE, though the program is still usable (that is, as long as you install the program over a network, since it comes on a 1.44MB floppy disk).

Sailing Master isn't completely compatible with an extension-heavy Mac system (it crashed a few times, though almost always when I was quitting the program), but it seems stable in a more vanilla setup.

Though speed and other clues point to less-than-polished programming, Sailing Master is a lot of fun—well worth the price for an inveterate competitor like me.

—STEVE ROTH

MAC-TO-PC NETWORKING . . .
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A Zillion Kajillion Rhymes 1.0

Writing Tool

PROS: Quick, small, simple, self-contained. **CONS:** Like all Mac rhyming dictionaries, rhymes only with roots of search words (and ignores *-ed, -s,* and *-ing* endings). **COMPANY:** Eccentric Software (206/628-2687). **LIST PRICE:** $49.95.

MW ★★★

When you think of business software
You imagine—let me guess—
Maybe Word, Excel, or Quicken,
ATM or QuarkXPress.

But if writing songs or poems
Is the way you pass the time,
Then the biggest boost to business
Would be software that can rhyme.

Now, it isn't so surprising
That the candidates are few.
(I reviewed one other prospect
Back in June of '92.)

Thus, Eccentric Software's latest
Ought to win an accolade;
It's a natty new addition
To the tools of poets' trade.

You just type a word, press enter—
And you're shown the words that rhyme,
Like a rhyming dictionary
In a fraction of the time.

You can filter out the long words
(Use the Syllables control);
You can open many rhyme lists
If you're really on a roll.

As an added bonus feature,
There's a pseudo-TeachText mode;
It's a window you can type in
To compose your psalm or ode.

You can't change the font or size there
(And it's Monaco—I checked).
But you do get instant rhymes for
Any word that you select.

Now, a poet craves perfection;
A reviewer craves the same.
But this program has a feature
That you'd have to label lame.

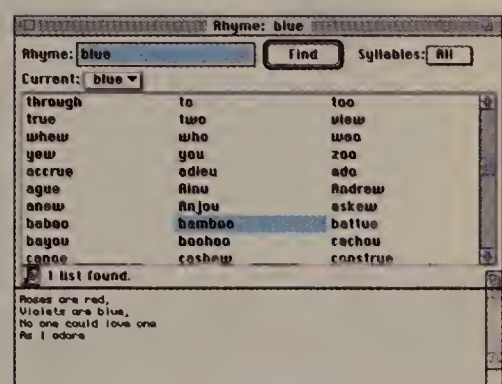
When you look for words like plurals,
You get rhymes that match the *root.*
(If you look up *boots,* for instance,
You get *loot, Beirut,* and *fruit.*)

It's the same with past-tense searches;
Look for *wedded,* you get *bed;*
It's a shame the program makes you
Do the hard part in your head.

Still, the software sure beats sitting
With a scratch pad and your wits,
Trying every combination
Till you find a rhyme that fits.

And it's self-contained, it's speedy,
And it's small and simple, too.
If your biz is writing verses,
Here's the business tool for you.

—DAVID POGUE



Roses Are Red A Zillion Kajillion Rhymes combines a list of rhyming words with a text processor. Scrolling down the list, you see words with more syllables. (The Syllables pop-up menu at top lets you view rhyming words with only a specific number of syllables.)

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WHAT

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MW LAB

OCR

The Recognition You Deserve

Macworld Lab looks at nine OCR programs

by Charles Seiter

Suppose you work for a law firm and the firm has decided to store all of its old paper records from the 1970s and early 1980s in electronic form, on Macintosh files. You don't want to retype thousands of pages—they were very neatly done, on IBM Selectric typewriters with Courier typeballs—so you're seeking a quick technological fix for your problem. In this case the fix exists.

Now suppose you're working in a small public relations agency and you want to collect, for a client, all relevant newspaper and magazine press clippings, plus assorted faxes and press releases, and put them all in a text database. For you, we've got some bad news.

In both scenarios, you would try to use optical character recognition (OCR) to translate scanned images of your documents into text files. As Macworld Lab tests show, you get good results only if you have very clean document images. But if the document images aren't almost perfect, OCR is more trouble than it's worth.

Pages of clean typing, for example, can be read at better than 99 percent accuracy, at least by the top programs. But none of the programs tested here can get usable results from a paper fax.

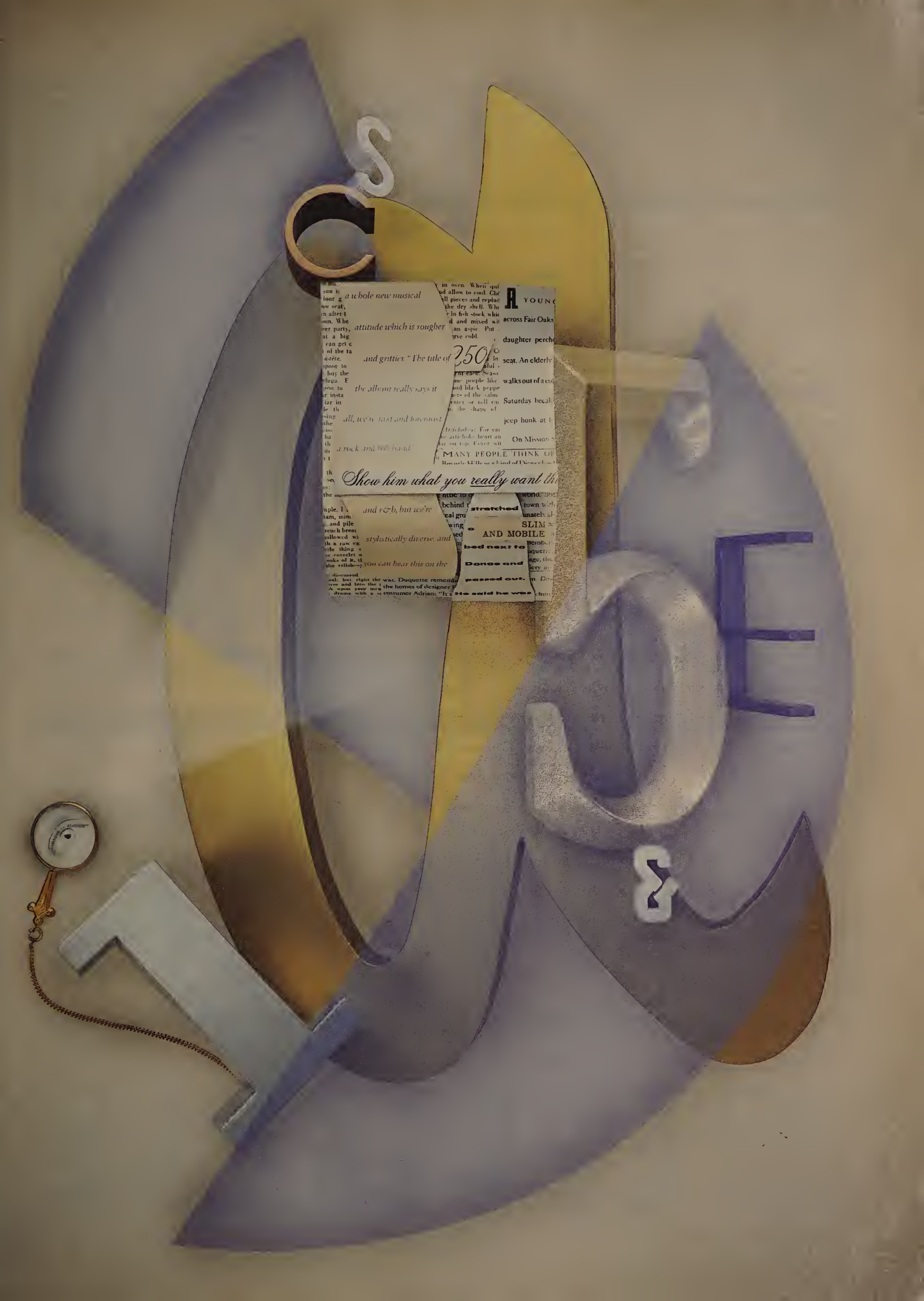
When you look at the lab results, keep in mind that an accuracy rate of 98.5 percent, which sounds pretty good, corresponds to one mistake every 65 characters, or about one mistake per line of text. That's enough to drive you crazy if you have to proofread the text file results to make sure that the final documents are completely correct.

The discrepancy between what users expect and what they get from OCR software makes for a volatile market: three of the programs examined in *Macworld*'s July 1992 roundup are either no longer available (TextScan for Macintosh from Prism Enterprises and ReadRight for Macintosh from OCR Systems) or undergoing "market-strategy reorientation" (Xerox Imaging Systems' AccuText).

What Is Accurate Enough?

To test OCR software, Macworld Lab scanned seven classes of documents: laser-printed, typed, legal, dot matrix–printed, fax, magazine, and newspaper.

The first three categories are the most important part of the test. To get any value from an OCR package, you need real accuracy on laser-printed, typed, and legal documents, which are standard in office practice today. Although the numerical difference between, say, 98.6 percent and 99.7 percent accuracy is small, there is a huge difference in practice—that 1.1 percent works out to nearly five times as many mistakes, which means that you might have to track down that


a whole new musical
attitude which is rougher
and grittier." The title of
the album really says it
all, we're first and foremost
a rock and roll band
Show him what you really want th
and r&b, but we're
stylistically diverse, and
you can hear this on the
MANY PEOPLE THINK OF
across Fair Oaks
daughter perch
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walks out of a co
Saturday break
jeep honk at
On Mission
stretched
AND MOBILE
SLIM
bed next to
Dance and
passed out.
He said he was

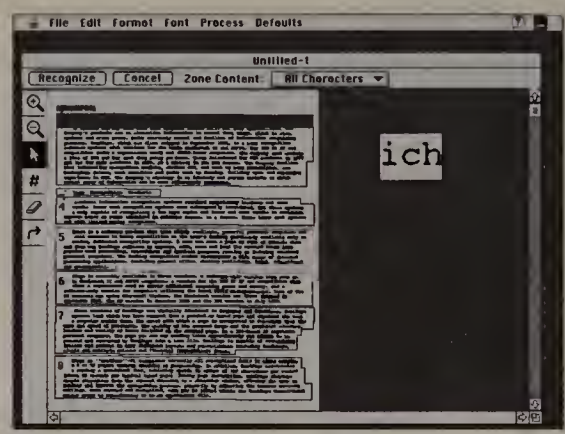
many more errors by proofreading.

Evaluate the Macworld Lab tests by looking for accuracies better than 99 percent on laser-printed, typed, or legal documents. If the accuracy drops below about 90 percent, you'll spend more time proofreading and correcting than if you just retyped the documents yourself.

The other documents (dot matrix–printed, fax, magazine, and newspaper) represent the frontier of OCR (and a far frontier it is, too). A program that shows 40 percent accuracy in reading a fax is not a bargain compared with one that manages only 36 percent, since you can drag either resulting text file right to the Trash without a twinge of conscience. Magazine scans are certainly better than faxes; but despite the reviewed OCR programs' greatly improved ability to read multiple columns compared with earlier versions of these OCR programs, you'll still have to proofread the results before you can use them confidently.

The most accurate programs in our lab results analyze an image's features to find patterns that correspond to known letters and other characters. But this pattern-recognition capability makes them acutely dependent on image quality.

A poor copy—one that is too light or too dark—changes those patterns, often so they can no longer be recognized electronically. You can compensate for some of this with your scanner by adjusting the brightness controls, but that only goes so far. For example, if you have an article on a darkened piece of newspaper, you may never find a brightness/contrast setting that gets the OCR reading accuracy you require.



Zoned Out In this OmniPage Pro screen, the grayed area in the text is being recognized, and the exact portion of text being recognized is shown in the little image-quality window at the right. If you watch the window, you can spot hard-to-read words as they cruise past.

Similarly, when you are trying to scan a fax, the extraneous information added and actual information dropped during faxing can obscure the patterns that the OCR software needs to correctly recognize characters. Although some programs provide smoothing and contrast utilities—much like Adobe Photoshop's filters—you can spend a half hour tweaking a scanned fax (and get only mediocre recognition results anyway), when you could have typed the document again in five minutes.

Beyond Accuracy

To use a baseball analogy, the best OCR programs can handle modest fastballs right over the plate but still fan the air on curveballs; the less-capable programs strike out on everything. Carefully consider issues other than accuracy when choosing an OCR program, because those issues can make or break an OCR's effectiveness in your work.

MW LAB

How OCR Programs Fare with Everyday Documents

Best result for each test. Products are listed in alphabetical order.

HOW ACCURATE ARE THEY?

Accuracy results show percentage of correct words in document. Longer bars are better.

Accuracy of less than 90 percent almost always results in unusable documents. The difference between, say, 92 and 96 percent accuracy is significant. Bars representing accuracy start at 90 percent, and there are no bars for less-accurate programs. Some documents—faxes in particular—are so difficult for OCR programs to handle that the results are often unacceptable.

	Laser-Printed Letter	Typewritten Letter (film ribbon)	Typewritten Letter (cloth ribbon)	Dot Matrix-Printed Letter	Faxed Letter	Legal Document	Magazine Article	Newspaper Article
Caere OmniPage Direct	97.2	99.4	99.1	97.1	21.3	99.1	94.9	95.6
Caere OmniPage Professional	99.2	100.0	99.4	96.9	09.6	98.7	98.2	99.0
Calera WordScan	94.8	95.8	99.1	97.4	32.1	99.4	96.4	95.2
Calera WordScanPlus	95.2	98.8	98.7	97.7	39.0	99.3	96.4	94.9
CTA TextPert	95.6	96.4	96.5	84.1	21.7	99.1	93.7	84.6
Dest Recognize	96.8	94.0	97.5	88.0	15.3	98.6	92.8	78.9*
ExperVision TypeReader	98.8	97.0	98.7	94.5	49.0	99.6	95.7	98.6
Logitech CatchWord Pro	96.4	93.5	96.2	89.6	26.5	97.3	95.1	82.1*
Olduvai Read-It Pro	50.2	85.1	96.2	40.2	12.4	96.4	89.4	91.4

Due to poor formatting, recognized text could not be printed out without introducing additional errors, and was therefore graded on screen.

HOW FAST ARE THEY?

Times are in seconds. Shorter bars are better.

Given an acceptable level of accuracy, the next most critical factor in choosing an OCR program is the recognition speed. Here, the speeds reflect the time to process one page.

Caere OmniPage Direct	59	39	53	107	301	68	69	83
Caere OmniPage Professional	61	47	41	135	339	65	71	54
Calera WordScan	43	28	30	47	161	81	69	112
Calera WordScanPlus	55	30	33	51	196	91	80	152
CTA TextPert	86	71	65	326	1034	92	107	94
Dest Recognize	55	55	49	139	173	85	166	121
ExperVision TypeReader	57	32	35	97	228	68	101	79
Logitech CatchWord Pro	91	75	72	157	169	132	197	198
Olduvai Read-It Pro	85	52	66	121	124	157	100	158

Which Documents Are Good Candidates for OCR? by Tim Warner

Optical character recognition (OCR) works well if the documents you want to read match the OCR software's expectations. But business documents today are often embellished with fancy fonts and graphics. Here's how to tell if OCR can handle your documents.

THE IDEAL DOCUMENT FOR OCR

OCR works best with simple documents. Nearly all OCR programs do a good job of reading text that's been laser-printed or typeset in a standard typeface (such as Times, Courier, or Helvetica) or in a clearly designed typeface (such as Cheltenham or Melior) and in a size between 10- and 12-point. The text should be in dark ink, on white paper; formatting should be simple, as in a business letter. Avoid using copies, or originals with stray marks such as creases, coffee stains, handwritten notes, or smudge marks. Generally, pristine documents require the least correction.

This is a close-up of easy-to-read type

This is a close-up of easy-to-read typ

This is a close-up of easy-to-rea

This is a close-up of easy-to-read type

WHEN IS THE TYPE TOO TOUGH?

Complex Formatting
Tables, multiple columns, and fragmented blocks of text befuddle OCR because it doesn't know how to group the text blocks. The result is usually tabbed text fragments that are difficult to reassemble into usable forms.

Small or Large Sizes
Type smaller than 9-point or larger than 28-point presents a challenge to OCR programs, particularly when a document uses multiple sizes together. Better programs handle text as small as 6-point and as large as 127-point.

9-point type
Small point sizes are ha

28-point type
Large p

Letter and Word Spacing
Tight letterspacing results in adjoined letters. For example, OCR may interpret *cl* as a *d* and *This* as *Tms*. When letterspacing is too loose, OCR inserts spaces between letters, and you lose the ability to search for words within the recognized text.

Too-tight spacing

Loose spaci

Stylized or Script Typefaces
Fancy or artistic fonts have exaggerated letter weighting and ornamental flourishes that often confuse OCR.

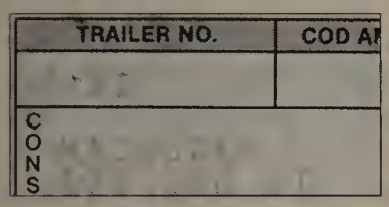
This is a close

This is

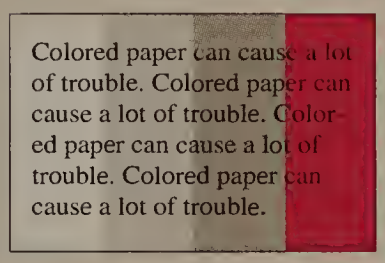
This is a close

WHEN IS OUTPUT QUALITY A FACTOR?

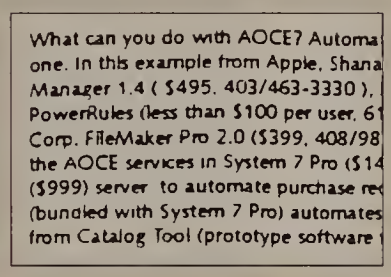
Carbon Copies
Documents such as invoices printed on carbon paper push the limits of OCR's capabilities. Text is usually faint, is often smeared at its edges, and is frequently printed on colored paper. Sometimes, lines through words further impede recognition.



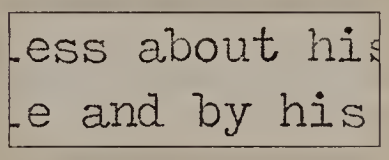
Colored Paper
Tinted and colored papers decrease the contrast between the background and the text during a scan. OCR then has the Herculean task of sorting out the text from the noise.



Photocopies
Xerographic copying smears text edges, obscuring the characteristics that let OCR identify some letters, such as the counters in *a* and e. Worse still are copies of copies.



Cloth-Ribbon Typewriter Output
As cloth ribbons age, they deposit ink less evenly. People also type with uneven force on manual typewriters. The resulting variety in character weight confuses OCR.



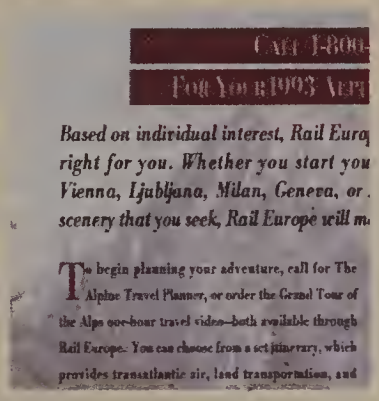
SPECIAL PROBLEMS

Newspapers
Multiple columns, narrow gutters, tightly spaced small type with display type mixed in, photos, and special symbols—all printed on dingy, yellowed paper—make newspapers one of the most difficult samples for OCR to read. The combination of so many hard-to-read elements stymies OCR.

Faxes
Text on fax documents becomes bumpy and uneven when dots near the edges of letters are lost or added during transmission. Poor quality is obvious here in the words *Staff* and *Succeed*. Frequently, the identifying features of letters such as the cross on a *t*, or the top of an e get lost or obscured. OCR programs then take their best, often inaccurate, guess.

E. Coordinated
staff of 11. Succeed
n which each dormi

Type over Screened Images
Like colored paper, gradients or images behind text reduce the contrast between the background and the text, resulting in badly darkened or mottled scans (and ultimately, illegible text). The AccuPage technology in Hewlett-Packard scanners increases the quality of the scan, allowing OCR a better chance at accurate recognition.



			SCANNING AND SETUP				ZONE CONTROL			RECOGNITI
Company	Product	List Price	Automatic Document-Feed Support	Double-Sided Document Support	Scanner Support	Graphics Extraction	Zone Templates	Format Retention	Preview Window	Training Mode
Caere Corporation	OmniPage Direct 1.0	$295	●	○	excellent	none	●	good	good	○
	OmniPage Professional 2.1	$995	●	○	excellent	excellent	●	excellent	excellent	●
Calera Recognition Systems	WordScan 1.01	$295	●	●	good	very good	●	very good	very good	○
	WordScanPlus 1.01	$595	●	●	good	very good	●	very good	very good	●
CTA	TextPert 4.0	$695	○	○	excellent	very good	●	very good	very good	○
Dest	Recognize 2.04	$495	●	●	fair	fair	○	fair	very good	○
ExperVision	TypeReader 1.0	$695	●	●	excellent	very good	●	excellent	good	○
Logitech	CatchWord Pro 1.0	$399	○	○	good	none	○	poor	fair	○
Olduvai	Read-It Pro 4.0	$595	●	○	poor	none	●	fair	good	●

● = yes; ○ = no. Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company's support technicians. Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests. [A] We could not rate support because the anonymity of our callers could not be guaranteed. [B] Also supports Apple's XTND translator software.

For example, if a scan is skewed (tilted) by more than a few degrees (2 degrees seemed to be the limit in our testing), the OCR process is usually terminally disrupted. If you're reading a multicolumn document, you will usually have to select reading zones manually. If you have a document image scanned in landscape mode and need to rotate it for reading, you may have problems: Read-It requires a much larger memory setting for rotating, TypeReader can't rotate at all, and rotating in TextPert frequently produced nonsense files.

Working with the Results

Any scanned document, however clean, is a candidate for OCR errors. No matter what companies might like you to believe, no OCR program can give you 100 percent accuracy except in special cases. That means that you must do a certain amount of cleanup, no matter what.

Some programs (OmniPage Professional, WordScan and WordScanPlus, Read-It Pro, TextPert, and TypeReader) provide a built-in editor for the cleanup process, and they mark questionable words so that you can spot them easily (for example, WordScan uses color and TextPert uses bullets). Other programs (Recognize, CatchWord Pro, and OmniPage Direct) simply export documents to your word processor for editing.

In either cleanup mode, identification of recognition errors is ultimately based on spell checking. For 100 percent accuracy in the final result, however, spell checking isn't good enough. A large assortment of common OCR misreads (for example, *or* for *on*, *it* for *if*) simply generate acceptable, correctly spelled English words. Three or four such errors in a sentence can make the sentence either baffling or hilarious. And if you want to find these errors, there is no alternative to proofreading the recognized document against the original.

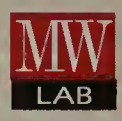
Some programs, like OmniPage Professional and Read-It Pro, offer an automatic spell-checking option. But Macworld Lab tests show this introduces harder-to-detect errors, since it often replaces a word misspelled during recognition with a correctly spelled but incorrect word. Why? Because they choose the first word on the list of possible words—that's like your word processor not asking you to confirm which word is correct when you use its spell checker. For example, in one test, OmniPage recognized *the* as *tbe*, and its automatic spell-checking option substituted *tee*, the first option in its list of correctly spelled suggestions.

For some OCR purposes (like making a text database of magazine articles) these mistakes may not be crucial. Still, you should make sure to spell check or read over the file to ensure that, for example, your keywords are spelled correctly. If you want to scan and recognize some form letters for use in business correspondence or for use in services like an online clipping service, you can either proof them word for word or resign yourself to looking ridiculous in print.

Rating the Programs

We narrowed the field of OCR programs available today to four sets of top contenders (several of which come in more than one version) and three also-rans.

BEHIND OUR TESTS



For all of our tests, we used eight documents: a laser-printed résumé, a cover letter typed with a film ribbon, a cover letter typed with an inked ribbon, a résumé printed on a letter-quality dot matrix printer, a faxed copy of a laser-printed résumé, a laser-printed legal contract, a three-column page from *Scientific American*, and a four-column article from the *New York Times*. Both multicolumn documents also included graphical elements and complex formatting. (We did not grade packages harshly for mishandling formatting.)

We scanned our test documents with a Hewlett-Packard ScanJet IIc using AccuPage, a IIc feature that improves scan quality by enhancing contrast over small regions of the page. This ensured the best image quality from which to judge OCR software's recognition abilities.

For recognition speeds, we timed from the start of document processing to the completion of processing for that page. This time includes the time each program took to locate blocks of text on the page. To gauge accuracy, we counted as one error any word that had errors in it, one error for any words added to or absent from the original text, and one error for misordered words or word blocks. Our guiding principle was that each time you needed to click and drag to make corrections counted as one error.—**Macworld Lab testing supervised by Tim Warner**

TIONS				OUTPUT FORMATS		CONSUMER INFORMATION		
Deferred Batch Operation	Spelling Checker	User Dictionaries	Verifier Window	Image Formats	Number of Text Formats	Phone	Toll-Free Phone	Technical-Support Rating
○	○	○	●	TIFF, fax	11	408/395-7000	800/535-7226	very good
●	●	●	●	TIFF, fax	11	408/395-7000	800/535-7226	very good
●	●	●	●	PICT, EPS, TIFF, fax	17	408/720-8300	800/544-7051	acceptable
●	●	●	●	PICT, EPS, TIFF, fax	17	408/720-8300	800/544-7051	acceptable
○	○	●	●	PICT, TIFF	3	203/786-5828	800/252-1442	not rated [A]
○	○	○	○	PICT, TIFF, fax	6 [B]	510/249-0330	○	very good
●	●	●	●	PICT, TIFF, fax	14	408/428-9988	800/456-0826	very good
○	○	○	●	TIFF	9	510/795-8500	800/231-7717	excellent
●	●	●	●	PICT, TIFF, fax	8 [B]	305/670-1112	800/822-0772	not rated [A]

OmniPage Direct and OmniPage Professional Besides having the highest ratings for accuracy on the documents that really count, these products from Caere Corporation, a pioneer in OCR methods, offer the widest range of options and settings (see the screen image "Zoned Out"). In a questionable marketing move, OmniPage Professional is bundled with a separate Graphics Editor that's not only a poor substitute for Adobe Photoshop but also has memory-management bugs.

OmniPage Professional gives significantly better results than OmniPage Direct on key documents (it's three times better at reading laser-printed text). The Graphics Editor in the Pro version certainly doesn't justify the $700 price difference between the two programs, but marginal improvements in accuracy beyond the 99 percent level become a very serious matter if you're stuck scanning and reading documents every day. Ask yourself if you'd rather look in your text files for 15 errors per day; that's the real difference between Professional and Direct. (Caere also sells the original version of this software, named just OmniPage, for $695. Its results are similar to those of the other Caere products.)

If you have large collections of documents generated in the same font, OmniPage Professional's training feature (the Macworld Lab results are untrained) can improve accuracy significantly. (Training is the process of correcting the results for typical documents so OmniPage Pro can apply those corrections to future documents.) In our experiments, the Pro version produced better than 99.7 percent accuracy on three standard Mac fonts (Geneva, Times, and Chicago). Ambitious users can, with a bit of programming, direct automatic operation of OmniPage Professional from within word processing or other applications with OmniPage Pro's Apple-events hooks.

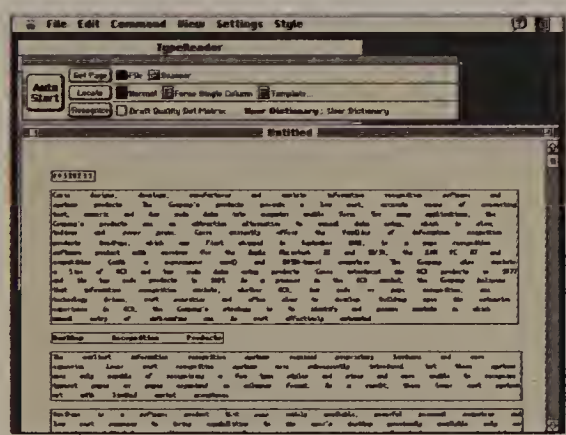
TypeReader ExperVision's TypeReader lives up to its name, placing first in reading legal documents (the legal documents were typed, with a line-numbering zone along the left margin). TypeReader placed a close second to the Caere products on laser-printed and cloth-ribbon typed documents. And it's the only product that holds out a hope of reading a very clean fax on paper.

TypeReader has a snappy, no-nonsense interface (see the screen image "Push-button OCR") and the best documentation of any OCR product, with tips for optimizing the output of each kind of popular scanner.

TypeReader cannot rotate scans, which means that you can't work with text documents printed in landscape mode unless you use an image editor, like Adobe Photoshop, to rotate the scan file first.

Overall, ExperVision managed to make TypeReader the most adept at performing hard tasks, without making it the best on "easier" documents.

WordScan and WordScanPlus These generally competent programs from Calera Recognition Systems offer many interface convenience features, and their overall accuracy on key documents ranks just behind the Caere products. The Calera programs are anomalously good at certain dot matrix scans, so they're worth a look if you're trying to scan and read older computer-generated documents.



Push-button OCR A few icons and buttons are all you need to direct TypeReader—you can master the interface in five minutes. TypeReader boasts reasonable accuracy on relatively bad images.

WordScanPlus has some additional nice touches, such as a pop-up verifier window that flags likely errors in an easy-to-see, moving text box, and movable job separators that delimit document sections and save them to separate files.

TextPert The Macworld Lab tests do not play to TextPert's strengths. CTA's program supports an awesome array of foreign alphabets. (Quick, where is the Galego dialect? In the upper northwest corner of Spain, around Santiago de Compostela, a bit of the medieval Spanish state recovered from the Moslems.) And TextPert has special facilities for inputting tables to spreadsheets. At reading plain old American text documents, TextPert isn't as accurate as Caere's OmniPage Direct, and it costs more.

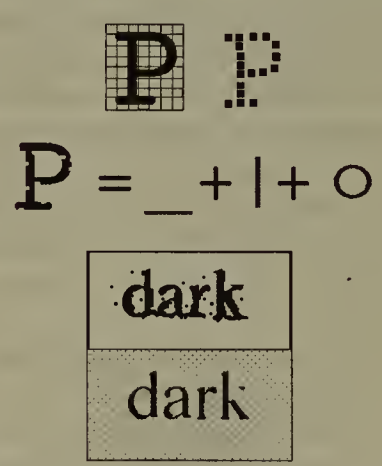
Other programs The other OCR programs all present special cases.

- If you absolutely must try to read scanned documents on a Mac Plus with 2MB of RAM, you can use Logitech's CatchWord Pro—if you can live with an error rate that amounts to a reading mistake every four words or so. Also, CatchWord Pro does not support the Hewlett-Packard ScanJet IIc scanner we used, and Logitech does not offer a driver or a workaround (although Macworld Lab found one—scan each page as an uncompressed TIFF file). Logitech assumes you have a more popular scanner, like the HP ScanJet+ or Apple OneScanner, or that you use TIFF files with CatchWord Pro.
- Olduvai's Read-It Pro, in the bundled version called Read-It ASAP, sports the OCR interface of the future—you

WHY OCR ISN'T PERFECT

Two decades ago, when the average computer user thought a font had something to do with water, OCR was much simpler. Only a few typefaces needed to be read, and a fairly straightforward technology called matrix matching gave results that were at least an improvement on retyping. Scanners cost a fortune back then, so it didn't matter that the software required mainframe power, because only government agencies or the largest businesses were playing the OCR game.

Then personal computers appeared, and the Macintosh brought a boatload of typefaces to business documents, and character recognition became more difficult. Storing copies of every font bitmap and its associated matrix would have required a huge amount of memory and would also call for constant updating. A new technique, called feature analysis, borrowing much of its technology from experiments in handwriting recognition, looks for letter features such as loops and crosses; it identifies letters by topological information rather than font-specific data, and then combines that information to figure out which character is being read.



Evolution of OCR Approaches OCR programs have used increasingly sophisticated recognition techniques over the years. Early OCR used matrix matching (top), which identifies a character by superimposing it over a grid and comparing the results with a library of character grids. Modern OCR uses omnifont recognition (middle), which identifies a character's major structures and compares them with the sets of structures it has defined for characters in common fonts. A new technique called noise removal (bottom) has the potential to recover a character's basic shape from the lowest-noise image consistent with the original data.

OCR technology has remained there for several years, since improving today's algorithm would be expensive but would yield little added improvement, and since today's computers don't have the resources to implement more accurate algorithms. But over the next five years, you will probably see some new technologies used in OCR programs that will bring reading accuracies closer to 100 percent, at least on straightforward document images.

First, with increased processor power it will be possible to provide different forms of automated cleanup of the scanned image. If the operator can provide font and size information (these programs are notoriously inaccurate at reading wide ranges of font size within the same document), the OCR program could apply scanning masks that enhance the recognizable features of individual characters or character pairs.

On future Macs using the PowerPC processor running at 66MHz or a digital signal processor (like the one in the new Centris 660AV and Quadra 840AV), there may just be enough power for a simplified form of a technique called maximum-entropy signal processing, currently used at the frontiers of pattern recognition in biomedical imaging and spectral analysis. This technique tries to filter out extraneous information by adding "noise" throughout the image to make the image's noise more uniform, which then makes the real information easier to distinguish. Current techniques have difficulty differentiating noise from meaningful data.

Both automated cleanup and maximum-entropy signal processing call for three to four times the processing power that you can get today on a Quadra 800, but Apple has already demonstrated a prototype PowerPC system with just that kind of power.

But until that kind of processing power is available, don't expect major improvements in OCR accuracy. The amount of work it would take for a company to give its product the ability to go from 97 percent to 98 percent accuracy is greater than the potential payoff. Regrettably, the easy gains in OCR have already been made.

simply drag the scan file over the Read-It ASAP icon to run the reading process. The catch is that, for both versions, the accuracy results are unacceptable.

- Dest's Recognize has accuracy numbers in the second tier, better in some cases than TextPert's, but it isn't scanner-friendly—it did not support the Hewlett-Packard IIc scanner we used, forcing us to save each page as an uncompressed TIFF file and have Recognize work on those. But Recognize does work with Dest's own Personal Scan scanner. This seems to be a case of a company expecting you to use both its hardware and its software.

Is OCR Right for You?

If you have piles of similar documents, neatly printed in black on white, the current state of the art in OCR will let you convert those documents fairly painlessly to Macintosh files. If you don't have lots of material, or if the material doesn't have high contrast or clear type, the case for OCR becomes much less compelling.

There are special-purpose applications, such as indexing large text files by keywords, where OCR makes sense at less-than-perfect accuracies. But OCR is still in the process of living up to its ultimate promise, and if you don't have a desperate need for printed-document-reading right now, you might want to wait until you do (see the sidebar "Why OCR Isn't Perfect" for an assessment of future technologies). **m**

Macworld contributing editor CHARLES SEITER has been working with OCR products since matrix-recognition programs running on minicomputers were the state of the art.

OCR SOFTWARE

To select the best OCR software, we looked primarily at recognition accuracy. Other important factors were user interface, speed, and technical support.

OmniPage Professional Caere knows that to be useful, an OCR program has to be optimized for straightforward documents. You need a Mac using a 68020 or better processor and 8MB of RAM for best results, but if you are serious about OCR, you need that hardware anyway. OmniPage Professional offers superior accuracy and an excellent user interface worth its high price. **Company:** Caere Corporation. **List price:** $995.

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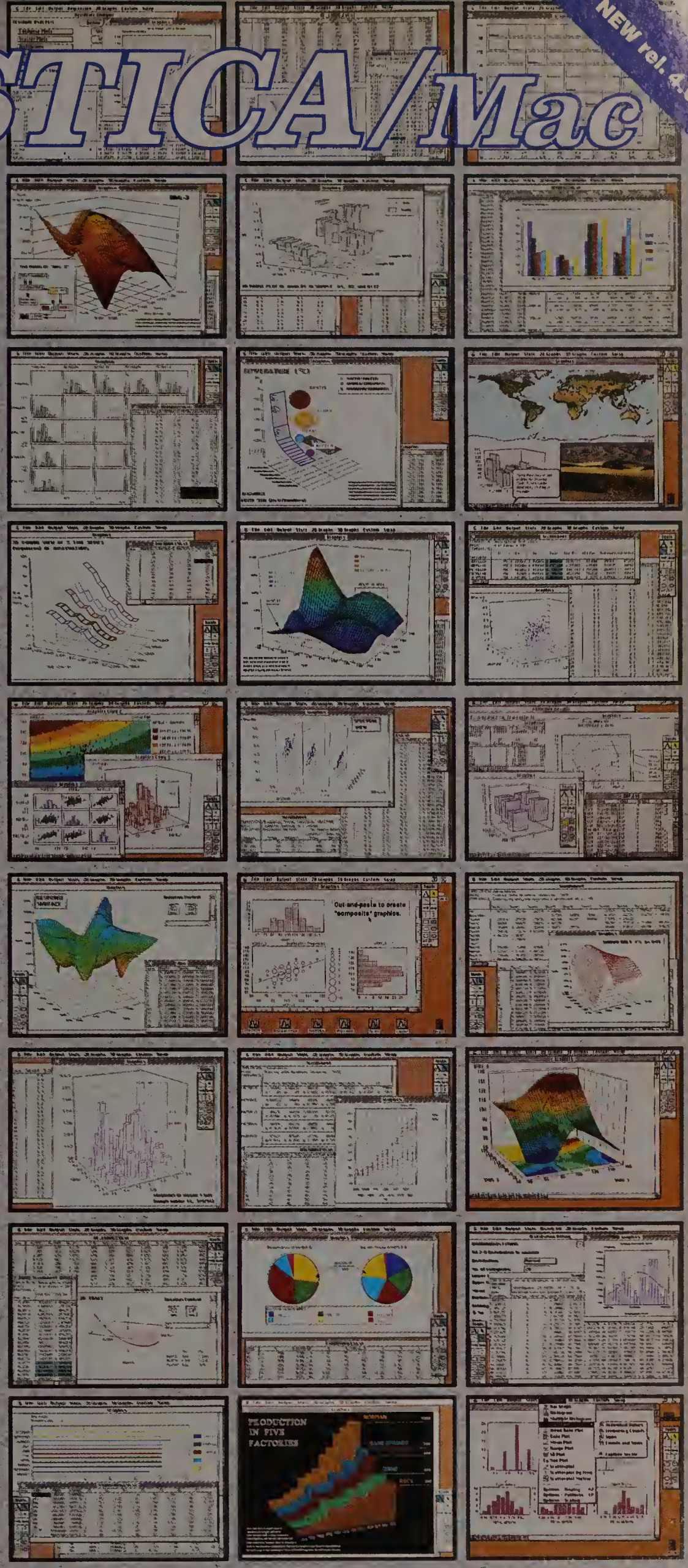

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The Apple Adjustable

THE DEFICIENCIES OF APPLE'S NEW KEYBOARD OUTWEIGH ITS ERGONOMIC ADVANTAGES

BY FRANKLIN N. TESSLER

Most turn-of-the-century office clerks would feel right at home using a modern computer keyboard. Except for additions like the ⌘, option, and other control keys, keyboard layout hasn't changed much since the familiar QWERTY scheme was introduced over 100 years ago. (Early typewriter keys were prone to jam, so the QWERTY design was devised intentionally to slow typing speed.)

Unfortunately, the standard arrangement of horizontal rows of keys on a flat platform sometimes causes repetitive strain injuries (RSIs)—no surprise to beleaguered computer users who suffer from hand, wrist, arm, or shoulder pain after long sessions at the Mac (see "Unnatural Positions Can Lead to Injuries"). Over the years, inventors have proposed alternative schemes ranging from a minor reshuffling of keys to radical reorganizations of the keyboard's shape and key placement. By and large, though, the major computer manufacturers have shied away from nontraditional designs, leaving innovation to smaller companies (see "Keyboard Alternatives").

Apple's Adjustable Keyboard, released early this year at a price of $219, represents the first foray by a mainstream computer vendor into alternative keyboard design. With its split arrangement and rounded wrist rests, the Adjustable Keyboard has an avant-garde look that commands attention. But does it improve on older models? To find out, I used the Apple Adjustable Keyboard for six weeks and polled a group of *Macworld* employees. As we discovered, the keyboard's few ergonomic enhancements are more than offset by design problems.

Split Layout

In contrast to traditional one-piece designs, the new keyboard is split into two parts. The main section is hinged in the middle so that the user can open each half up to 15 degrees from center, creating a mildly curved typing surface. The keyboard sports an oversize, curved spacebar, and four new control keys on the right let you adjust the Mac's volume up or down, mute the speaker, and start or stop sound recording on Macintoshes with built-in audio digitizers. A pair of detachable plastic wrist rests hook onto the front, and retractable feet in the back allow you to tilt the keyboard upward by slightly more than 7 degrees.

The keyboard's main section resembles the older Apple Extended Keyboard, with a few exceptions. The esc key is separate from the other keys and has an elongated key cap, and, unlike the Extended Keyboard, there are no ⌘ and option keys on the right side of the spacebar.

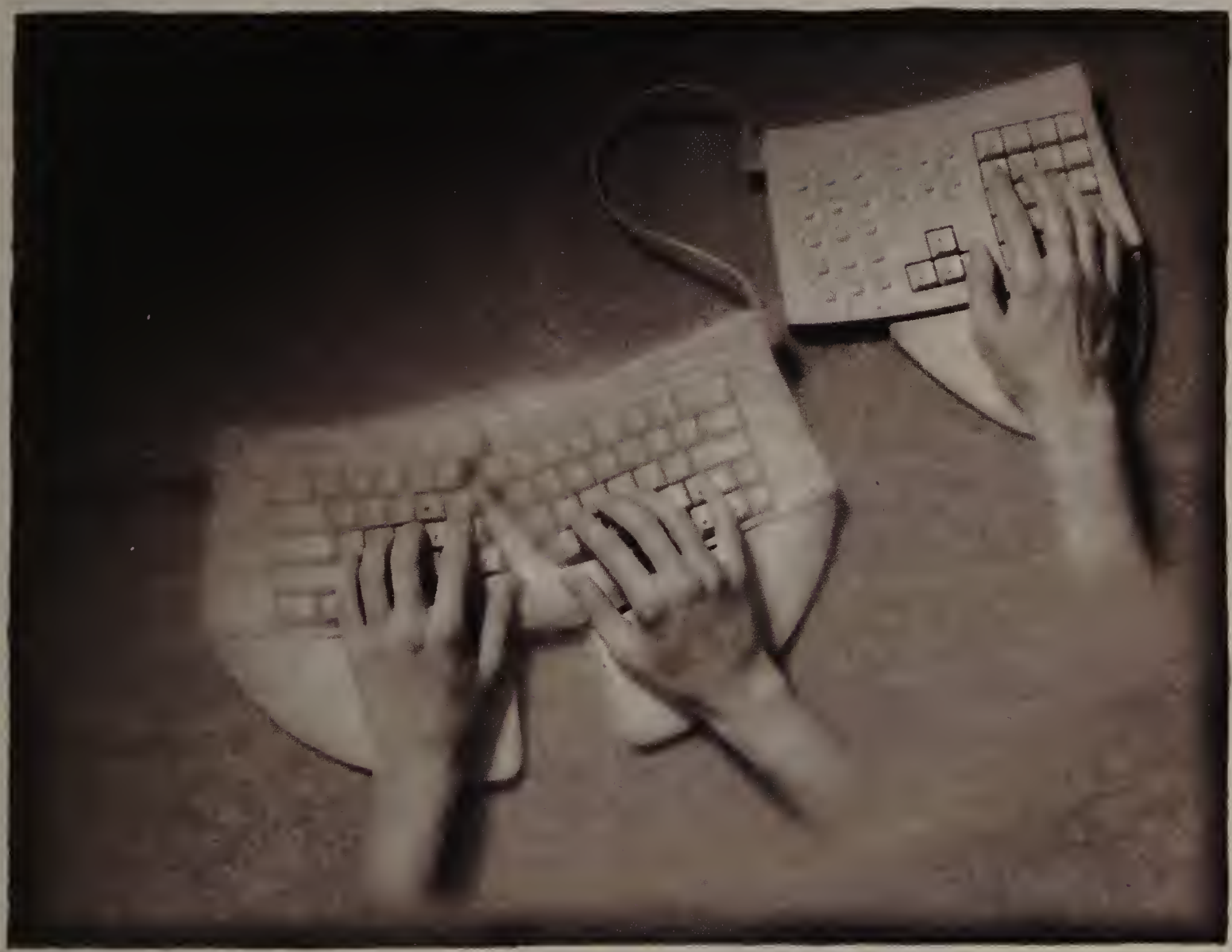
The function and numeric keys are located on a separate keypad that connects to the main unit with a short ADB cable. A curved wrist rest also attaches to the front of the keypad. The number keys on the right are arranged in the standard way, and four cursor-control keys in the middle are flanked on the left by five rows of function keys. A set of special control keys (such as page up, page down, and home) located in the upper part of the keypad completes the layout.

The caps and buttons used for the numeric keypad's function and special keys deviate from Apple's earlier designs. Compared with standard keys, the new caps are noticeably smaller, and the buttons have a firmer feel. (The sound controls on the main keyboard use the same kind of buttons.)

Negative Response from Users

To test the Apple Adjustable Keyboard, nine *Macworld* employees—men and women representing a range of hand sizes and experiences with RSIs—each used one exclusively for a minimum of two

Keyboard



weeks. Then they completed a detailed questionnaire comparing the Apple Adjustable Keyboard with the Extended Keyboard. We evaluated the keyboard on 27 points—from overall appearance to key layout and activation pressure. The *Macworld* testers rated the Apple Adjustable Keyboard inferior to the Extended Keyboard in 14 categories, equal in 9, and better in only 4.

The separate numeric keypad was the keyboard's least popular feature by far. The majority of the testers complained that the Adjustable Keyboard's two-piece construction took up far too much desk space, and that the numeric keypad made it difficult for right-handers to manipulate the mouse. The first arrangement suggested in the manual—with the keypad interposed between the mouse and keyboard—left me about a foot short on desk space and arm length. The second choice, with the keypad to the left of the main unit, made it awkward to use the keypad with my left hand. In the end, I decided to follow Apple's final suggestion, and I got rid of the keypad entirely.

The keypad's function keys also drew a slew of negative comments, largely because their location on the numeric

KEYBOARD ALTERNATIVES

The Bat uses a process called chording—entering each character based on a combination of keystrokes—to achieve significant ergonomic improvements, according to Infogrip, which sells the unusual-looking device.

In the computer industry, smaller vendors often take the lead in expanding the limits of technology. So it goes with keyboards. I took an informal look at several alternative text-input devices, some of them still in the prototype stage. Unfortunately, most offer only marginal ergonomic advantages over standard keyboards. But three radical designs stand out from the pack.

The Ullman Keyboard (The BackCare Corporation, 312/258-0888) sports an inverted-V shape and is designed to be held in the user's lap. The alphabet keys are canted to reduce pronation, and my hands felt very comfortable on a nonworking prototype that I examined. Still, it might take users—especially touch typists—considerable effort to grow accustomed to the unusual key positions.

The Bat (Infogrip, 805/566-1049, one keypad $295, two keypads $495) isn't a keyboard at all. The keypad has only seven keys, four for the fingers and three for the thumb. Unlike regular keyboards, which require you to press only one or two keys to enter most characters, The Bat makes you press combinations of up to five keys at once. The process of entering data—akin to striking chords on a piano—is called chording.

The Bat improves hand placement with a large integrated palm rest, and reduces finger motion—only the thumb changes position during normal use. The Bat's compact keypads offer another ergonomic advantage over standard computer keyboards—you can use them just about anywhere, from desktop to the arm of a chair to your lap. You're likely to find a comfortable position.

Before you leap ahead with The Bat, however, remember that you have to learn to type from scratch. Infogrip claims that new users can get up to speed in hours, but memorizing The Bat's extensive suite of chords demands a good deal of concentration. And while you're learning, glancing at the keypad's unmarked keys doesn't tell you what keys to press if you forget a chord. Still, the effort may pay off for RSI sufferers and for disabled users who can't work with standard keyboards.

The DataHand, from Industrial Innovations (602/860-8564, $2000), is also a chording device, but, unlike The Bat, it doesn't have any keys at all. With your hands cradled in The DataHand's ample palm rests, your fingers fall naturally into five recessed receptacles—you enter characters by pressing combinations of switches built into each recess. Because the switches require little activation pressure, Industrial Innovations says, The DataHand induces less muscle fatigue than conventional keyboards, and offers other ergonomic advantages.

keypad made them less convenient to reach for activating macros and other shortcuts. Users also complained that the smaller buttons were harder to press. Two *Macworld* staffers also lamented the enter key's absence from the main keyboard, especially for applications that rely on the key for data entry.

The Apple Adjustable Keyboard's wrist rests also came in for harsh criticism from our panel. Many of the testers found the plastic construction flimsy, and several commented that they preferred the smaller padded wrist rests widely available from computer stores. Because Apple's wrist rests rely on the weight of the keyboard to hold them in position, they're prone to detach from the keyboard during use. I found it nearly impossible to move the keyboard around my desk without dropping at least one wrist rest.

The news for Apple wasn't all bad, though. For example, the majority of the test group felt that the Apple Adjustable Keyboard's split design resulted in a more relaxed wrist position. Not surprising, our panel also appreciated the keyboard's volume, mute, and record buttons, which they rated easier to use than the control panel software and mouse.

Ergonomics versus Economics

The Apple Adjustable Keyboard's split design and wrist rests can indeed place the wrist in a more natural position while typing, a fact echoed by several ergonomics experts I spoke with. But the flat arrangement of the new keyboard still requires users to rotate their forearms to reach the keys, possibly contributing to muscle fatigue and pain.

Given such clear deficiencies, why would Apple design the keyboard in this way? Apple designers say that they were forced to reject several radical keyboard rearrangements in order to build a product that would appeal to hunt-and-peck and touch typists alike. As these designers explain it, the final design represented a compromise between ergonomics and practical manufacturing and marketing considerations.

For example, Apple's decision to use smaller function keys on the numeric keypad was intended to save space, already at a premium given the keyboard's modular split design. According to Apple engineers, the function keys require no more activation pressure than the buttons on a car radio, although they are firmer than standard keys.

To the extent that the Apple Adjustable Keyboard induces users to adopt a more natural wrist position, members of the Apple team felt that they were suc-

cessful in meeting their design goals. They conceded that the concept of a separate numeric keypad with small function keys might merit reworking in future releases, but were vague as to how they would solve this problem.

Beware of Ergonomics Claims

Wisely, Apple isn't making any forceful claims for its Adjustable Keyboard. Apple's product literature advertises that the keyboard's ergonomic design can help you work more comfortably, but makes no mention of RSIs. (There is little, if any, scientific evidence that alternative keyboard designs offer health benefits for RSI sufferers.) Unfortunately, that's not what some Apple dealers are telling potential customers: of the eight computer-store reps in greater Los Angeles and the San Francisco Bay Area that I surveyed by telephone, six claimed that the Apple Adjustable Keyboard could help prevent or alleviate pain and fatigue. (The remaining two salespeople cited Apple's brochures but made no specific claims about the Apple Adjustable Keyboard's effect on RSIs.)

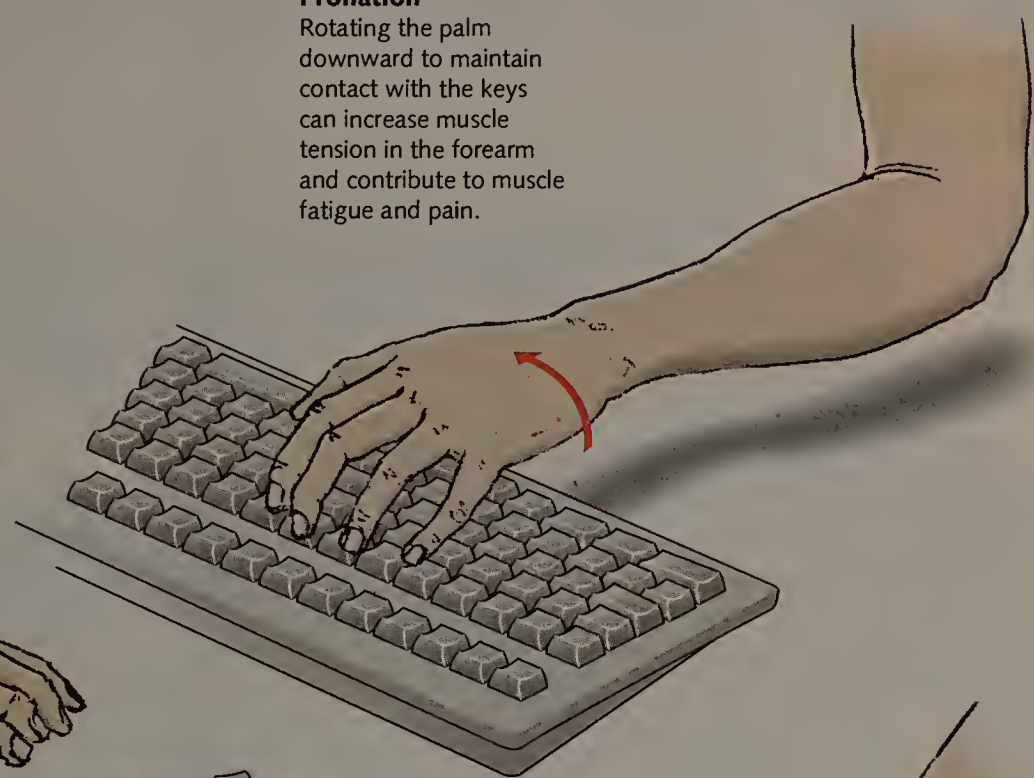
Although the Adjustable Keyboard's wrist rests and split design may help mitigate some of the factors that contribute to RSIs, the experience of *Macworld* testers shows that Apple's implementation cries out for improvement in several areas, especially the numeric keypad. If you're considering an Apple Adjustable Keyboard, first borrow one for a week or two to see if you get any relief from it and if you can live with its shortcomings. **m**

Contributing editor FRANKLIN N. TESSLER is a physician with a special interest in input devices.

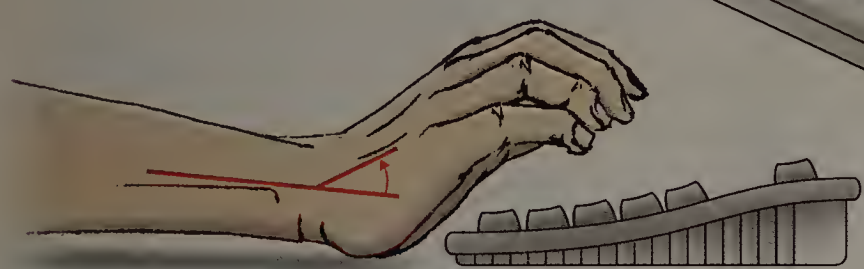
Unnatural Positions Can Lead to Injuries

Repeated motion, localized stresses, forceful exertion, and posture are all thought to contribute to the development of repetitive strain injuries (RSIs). Carpal tunnel syndrome, one infamous type of RSI, occurs when the lining of the tendons that pass through the carpal tunnel in the wrist swell, putting pressure on the median nerve, causing pain, tingling, and numbness in the hand. In some cases, only surgery can release the pressure on the nerve and relieve symptoms. Keyboarding can lead to carpal tunnel syndrome and other ailments by forcing users to adopt unnatural postures.

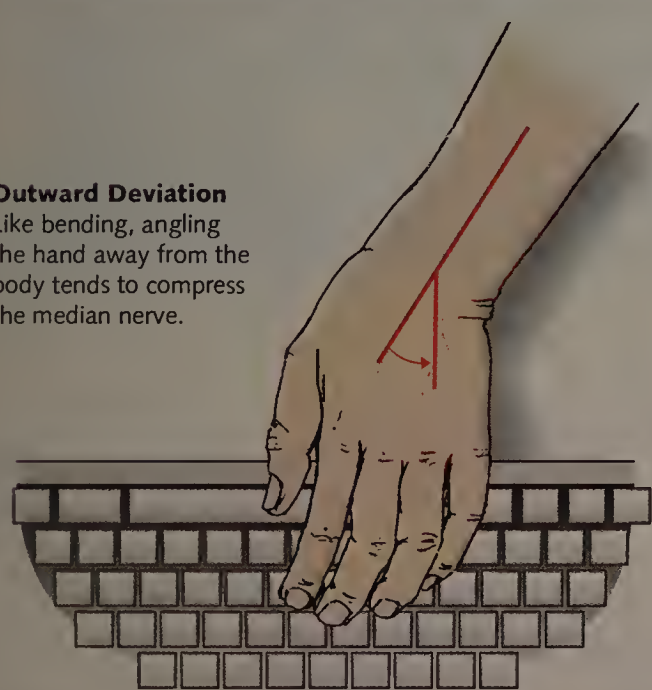
Pronation
Rotating the palm downward to maintain contact with the keys can increase muscle tension in the forearm and contribute to muscle fatigue and pain.



Bending
Bending reduces the size of the carpal tunnel, and tends to compress the median nerve.

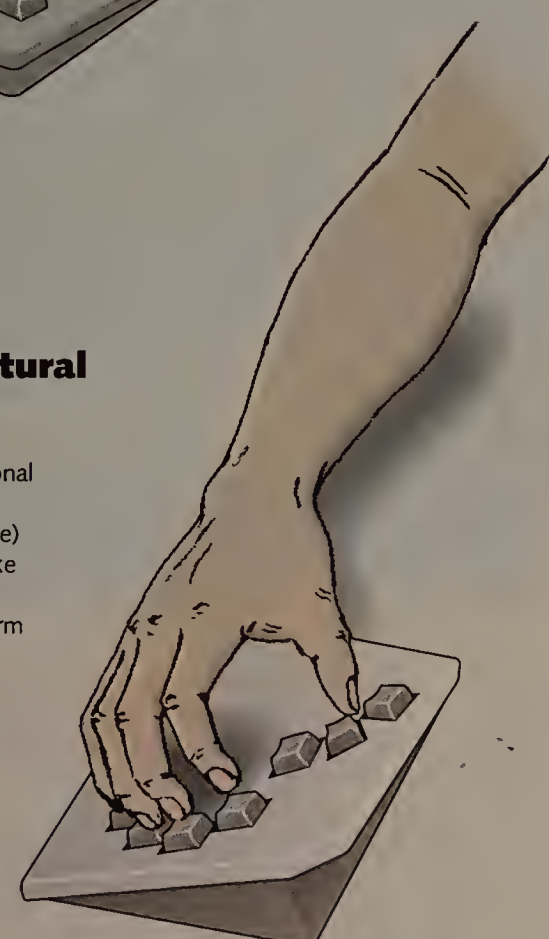


Outward Deviation
Like bending, angling the hand away from the body tends to compress the median nerve.



A More Natural Position

A few unconventional keyboards (such as The Bat shown here) are designed to take advantage of an at-rest hand and arm position.



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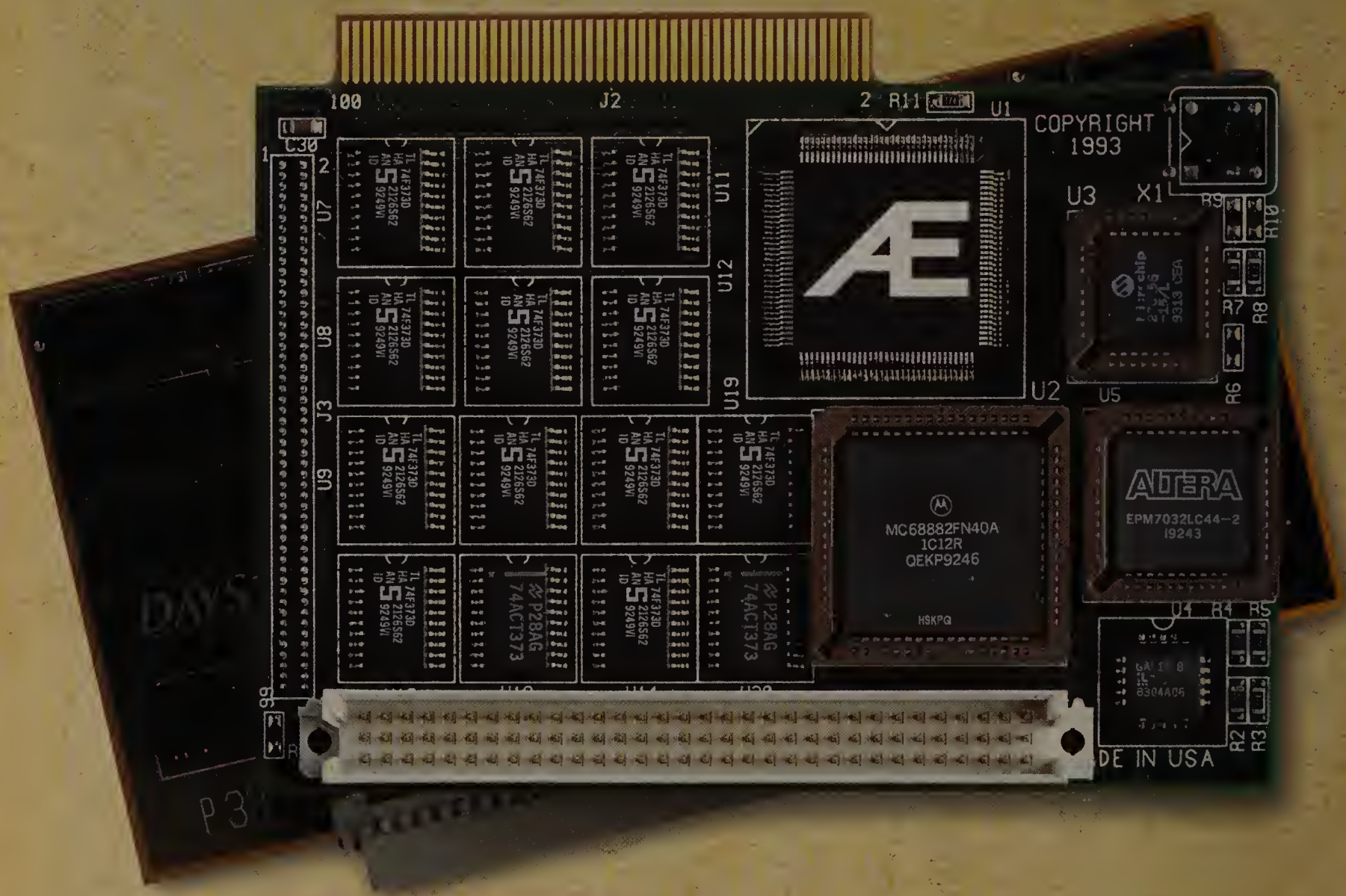

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		DAYSTAR	NA	No	NA
	40 MHz w/Cache	AE	11.5	Yes	$428
		DAYSTAR	11.09	No	$698
68030 LC, LCII Color Classic Peforma 400 Series	33 MHz	AE	2.65	Yes	$449
		DAYSTAR	2.52	No	$498
	40 MHz	AE	3.13	Yes	$449
		DAYSTAR	3.07	No	$698
68040 II, IIx, IIci, IIvi, IIvx, IIsi Performa 600 Series	25 MHz	AE	4.5	NA	$999
		DAYSTAR	4.7	NA	$1,299
	33 MHz	AE	5.0	NA	$1,199
		DAYSTAR	5.0	NA	$1,599
	40 MHz	AE	5.5	NA	$1,499
		DAYSTAR	5.2	NA	$2,399

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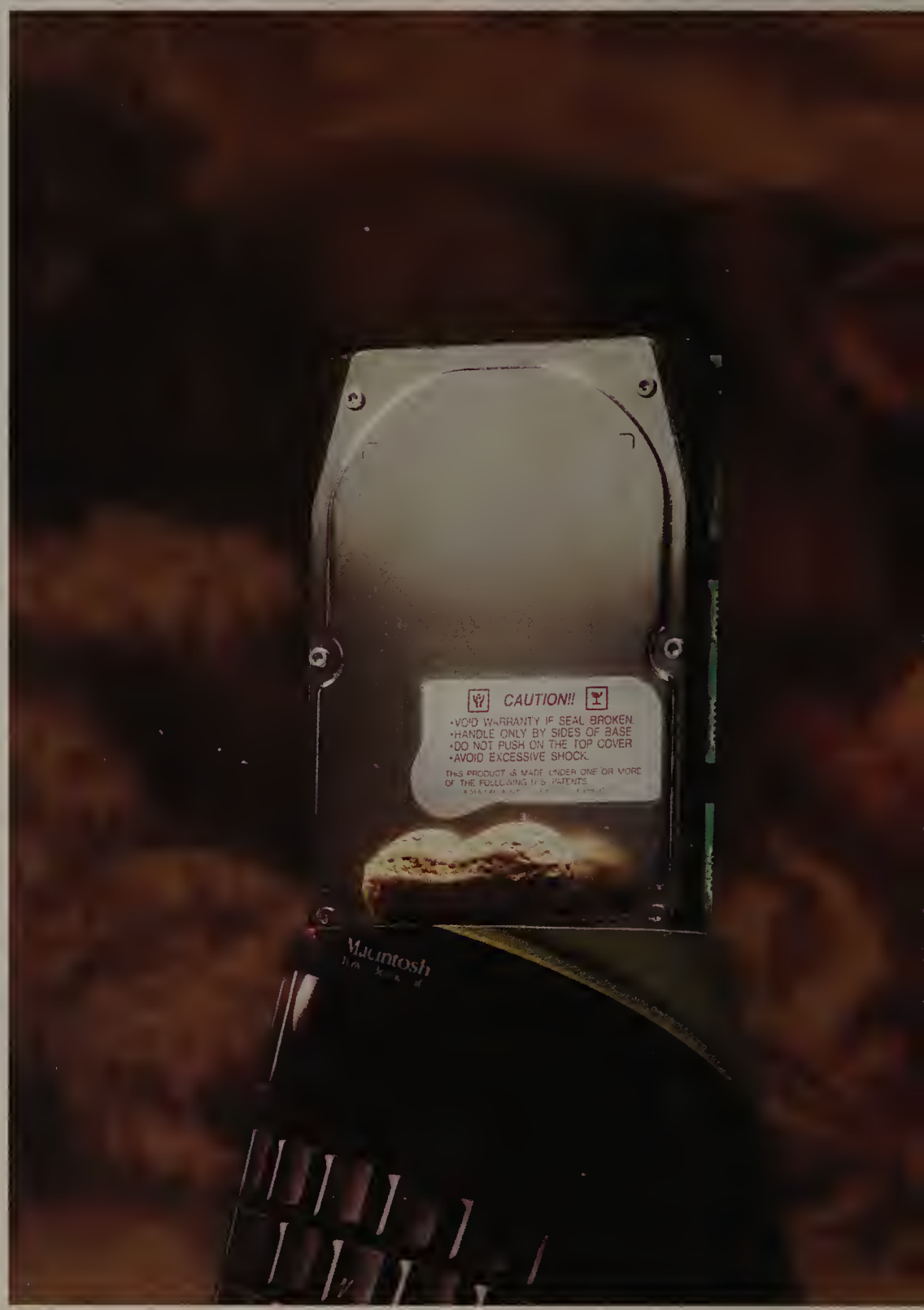
Circle 167 on reader service card

Jumbo POWERBOOK

MACWORLD LAB TESTS 13

by Tom Negrino



MW LAB

STORAGE

LARGE-CAPACITY HARD DRIVES

PAUL FRANZ-MOORE

Tired of tossing old files from your PowerBook hard drive so you can make room for new ones? Limited disk space has always been the bane of PowerBook users' lives, but at long last a suite of larger-format hard drives—as large as 300MB—are yours for the choosing. Choosing turns out to be the tricky part. Macworld Lab tested a selection of these commodious 2½-inch drives and found little performance difference among the units. Ultimately, deciding which drive is best for you means gauging current and future disk space needs and then comparing prices, warranties, bundled software, and technical support.

Par Performance

To test the speed of the 13 hard drives included in the review, Macworld Lab ran its standard set of hard drive speed tests (see "Behind Our Tests"). For example, the FWB Hammer PB 210 was the fastest in the 4th Dimension, FileMaker Pro, and Microsoft Excel and Word tests; but even the slowest drive in each test sneaked in with scores that were less than five seconds behind those of the Hammer PB 210. If you are used to the performance of an old 20MB or 40MB hard drive, these newer, faster drives will surely feel speedier, but among the drives tested, the differences in speed were negligible.

I installed the ETC Peripherals 213MB drive in my PowerBook 140, for instance, and immediately noticed a real improvement over my stock Conner Peripherals 40MB unit. The ETC drive, based on a Toshiba mechanism, spun up from sleep mode more quickly, loaded applications faster, and was quieter than the Conner. And the extra space proved a great relief.

Thinking that perhaps these drives might differentiate themselves by their use of battery power, Macworld Lab wrote a macro that tests power consumption and discovered that the drives draw almost the same amount of battery power under the test conditions (from 2 hours and 20 minutes to 2 hours and 30 minutes). Once again, the difference is not significant. Obviously, other power-consumption factors—backlight intensity and processing speed, for instance—contribute greatly to the amount of power you will get from a battery.

It's All in the Mechanism

Macworld Lab discovered the reason for the similarities in results among the tested drives—only three mechanism manufacturers were represented. Quantum offers a Go series that includes both 80MB and 120MB models. (A third capacity, 160MB, is in short supply and *Macworld* did not receive one.) Toshiba made the largest mechanism in the overview: a 213MB model. Although the first shipping 213MB units sometimes caused the PowerBook to freeze when waking up from sleep mode, Toshiba has eliminated the problem. To compare these three mechanisms with stock drives, Macworld Lab also tested the 80MB and 120MB IBM drives that came with the two PowerBook 160s that were used for testing.

It may, at first blush, look as though 213MB is a fine upper limit, but multimedia presentations and 24-bit image files soon fill even those drives, and a number of vendors—FWB, Seagate, Maxtor, and Quantum—are gearing up to offer even larger capacity drives. From FWB, *Macworld* received a prerelease

PowerBook Hard Drive Features

Company	Product	Tested by Macworld Lab	List Price	Mechanism Used	Money-Back Guarantee (in days)	Toll-Free Tech Support	Phone	Toll-Free Phone	Technical-Support Rating
Apple	internal 80MB	●	[1]	IBM WDS280	0	●	408/996-1010	○	[2]
	internal 120MB	●	[1]	IBM WDS2120	0	●	408-996-1010	○	[2]
APS Technologies	APS 80GRS	○	$239	Quantum Go 80	30	●	816/483-6100	800/874-1428	unacceptable
	APS 120	●	$329	Quantum Go 120	30	●	816/483-6100	800/874-1428	unacceptable
	APS 160GRS	○	$459	Quantum Go 160	30	●	816/483-6100	800/874-1428	unacceptable
	APS T-213	●	$569	Toshiba MK2224FB	30	●	816/483-6100	800/874-1428	unacceptable
ETC Peripherals	ETC PowerBook 80	○	$315	Quantum Go 80	30	●	813/884-2863	800/876-4382	acceptable
	ETC PowerBook 120	●	$339	Quantum Go 120	30	●	813/884-2863	800/876-4382	acceptable
	ETC PowerBook 160	○	$489	Quantum Go 160	30	●	813/884-2863	800/876-4382	acceptable
	ETC PowerBook 213	●	$599	Toshiba MK2224FB	30	●	813/884-2863	800/876-4382	acceptable
FWB	Hammer PB 120	●	$609	Quantum Go 120	0	○	415/474-8055	○	very good
	Hammer PB 210	●	$829	Toshiba MK2224FB	0	○	415/474-8055	○	very good
MacProducts	Magic 80 PowerBook	○	$319	Quantum Go 80	30	○	512/476-5295	800/622-3475	excellent
	Magic 120 PowerBook	●	$379	Quantum Go 120	30	○	512/476-5295	800/622-3475	excellent
	Magic 213 PowerBook	○	$619	Toshiba MK2224FB	30	○	512/476-5295	800/622-3475	excellent
Mass Microsystems	HitchHiker 120	●	$779	Quantum Go 120	0	●	408/522-1200	800/522-7979	very good
Microtech International	RoadRunner 80i	○	$359	Quantum Go 80	0	●	203/468-6223	800/626-4276	unacceptable
	RoadRunner 120i	●	$399	Quantum Go 120	0	●	203/468-6223	800/626-4276	unacceptable
	RoadRunner 200i	○	$609	Toshiba MK2224FB	0	●	203/468-6223	800/626-4276	unacceptable
Procom Technology	Atom 80-PB	○	$595	Quantum Go 80	0	●	714/852-1000	800/800-8600	good
	Atom 120-PB	●	$695	Quantum Go 120	0	●	714/852-1000	800/800-8600	good
	Atom 200-P8	●	$895	Toshiba MK2224FB	0	●	714/852-1000	800/800-8600	good

● = yes; ○ = no. *Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company's support technicians. Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests.* [1] *Sold as part of a PowerBook.* [2] *We did not rate technical support, since this product is sold as part of a PowerBook.*

MW LAB PowerBook Hard Drive Speed Tests

All times are in seconds except SCSI Read and SCSI Write, which are in MB per second.

Relative Speed
- 100% (Fastest)
- 90%–99%
- 80%–89%
- 70%–79%
- 0%–69%

			Duplicate	Open	Save	Search	Sort	SCSI Read	SCSI Write
Overall Fastest	1.00	FWB Hammer PB 210 (Toshiba)	28.6	[illegible]	[illegible]	[illegible]	[illegible]	1.10	0.92
	0.99	APS T-213 (Toshiba)	28.7	[illegible]	[illegible]	42.4	[illegible]	1.05	0.92
	0.99	Procom Atom 200-PB (Toshiba)	28.9	[illegible]	[illegible]	42.7	18.6	1.09	0.89
	0.99	Procom Atom 120-PB (Quantum)	[illegible]	113.6	[illegible]	44.8	20.1	[illegible]	[illegible]
	0.98	Microtech RoadRunner 120i (Quantum)	25.2	113.9	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	0.97	ETC PowerBook 120 (Quantum)	25.0	[illegible]	97.1	44.[illegible]	19.9	[illegible]	[illegible]
	0.97	APS 120 (Quantum)	[illegible]	116.8	97.[illegible]	44.5	[illegible]	1.12	0.90
	0.96	FWB Hammer PB 120 (Quantum)	[illegible]	115.4	103.1	44.6	20.7	1.07	[illegible]
	0.95	Mass Microsystems HitchHiker 120 (Quantum)	25.8	[illegible]	101.2	44.6	20.0	1.06	0.91
	0.91	ETC PowerBook 213 (Toshiba)	30.3	[illegible]	99.8	60.6	[illegible]	1.06	[illegible]
	0.90	MacProducts Magic 120 PowerBook (Quantum)	33.1	123.8	103.7	44.[illegible]	20.0	0.95	0.83
	0.88	Apple internal 120MB (IBM)	29.4	124.6	113.5	49.6	21.8	0.91	0.86
Overall Slowest	0.86	Apple internal 80MB (IBM)	29.7	127.3	115.4	48.8	21.5	0.77	0.77

The drives are listed from overall fastest (top) to slowest (bottom). To determine rankings, Macworld Lab indexed test results against the fastest drive in each test. Thus, the FWB Hammer PB 210 gets a 1.00, and the Apple internal 80MB gets a 0.86. Index numbers for overall performance are listed to the left of the product names.

We measured each drive's ability to duplicate a 3.2MB file, to search a 4th Dimension database for a specific record, and to sort a FileMaker Pro database. We also averaged each drive's speeds for opening and saving files from several applications, including Excel 4.0, PageMaker 4.2a, and Microsoft Word 5.0.

sample of a new Toshiba mechanism that boasts 330MB. The drive compared favorably with the other drives in our performance tests, but because it wasn't shipping, it isn't included in our official test results. This drive should be in full production and readily available by the time you read this, and pricing is expected to start under $800.

Checking the Bundles

All hard drives require formatting, and all of the drives we received come with software that allows you to format, test, and in most cases partition your hard drive. In addition, the formatting software from FWB, APS Technologies, Procom Technology, Mass Microsystems, and MacProducts enables you to password-protect partitions to prevent unauthorized people from gaining access to your files.

FWB provides a particularly useful package, Hard Disk ToolKit. It consists of several modules that give advanced users control over virtually every possible aspect of SCSI drive setup and performance. And you don't have to be a SCSI maven to use the package effectively. Hard Disk ToolKit is designed to set up drives automatically, and it optimizes them for the best performance. It has the best partition control and password protection of any of the software bundled with these drives, and it is unique in that it allows on-the-fly data encryption in a partition. Hard Disk ToolKit also has thorough tools that let you test drives for bad blocks and other defects.

Some vendors bundle a few extras with their drives. APS and Microtech include collections of shareware programs as extras. APS also includes Dantz Development Corporation's DiskFit Direct backup program.

Installation Dilemmas

Deciding whether to install an internal PowerBook hard drive yourself or leave it to the experts is an inevitable question. If your PowerBook is still under warranty and you want to keep it that way, you must have an Apple-authorized service center install a new drive. I surveyed several Apple dealers for installation pricing and found that it ranged from free (if you buy the drive from the dealer) to as much as $80. Most of the dealers I spoke to would transfer data from your old drive to the new one on request as part of the price of installing your new drive.

For the daring and those with expired warranties, installation requires care, but it isn't that difficult. All of the drives in this article arrived ready for installation except for the Mass Microsystems HitchHiker 120, which came in a small, AC-powered external case designed to connect snugly to the back of a desktop Mac. To install the drive in your PowerBook, you must first remove the mechanism from the external case.

It's always a good idea to wear a grounded wrist strap when installing a drive—static electricity will damage your PowerBook's circuitry. The main chore in installing a new PowerBook drive is getting the case open. The PowerBook 100 is easy, requiring two common screwdrivers—a regular one and a small Phillips. All other PowerBooks require a size 8 and a size 10 Torx screwdriver; the pair will cost about $15. Because the Duos require more precision in installation, unless you're very comfortable with working on computers, I recommend that you let an Apple service center upgrade your Duo's hard drive.

APS includes detailed, step-by-step installation directions with lots of photographs. Mass Microsystems' instructions provide plenty of detail and good illustrations. Microtech and MacProducts could improve their instructions; neither provides enough illustrations for the novice.

The Orphan Problem

After upgrading your PowerBook with a spiffy new drive, you're left with the old drive. You could recycle it into an external case. Both APS and Microtech offer two compact cases: a 110V AC version goes for $79 and an AC/DC version with a rechargeable battery that is $169 from APS and $159 from Microtech. For those of you who are swapping out a 20MB hard drive, these cases might not make financial sense; a brand-new 40MB external drive costs only about $200. If you opt for Mass Microsystems' HitchHiker, you inherit a case that is ready to use with your old drive, but at $779, the drive and case cost as much as $450 more than other drives with the same mechanism.

Another possible destination for old PowerBook drives is the Apple LaserWriter Pro 630; you can install your old PowerBook drive as a font disk. APS sells a $69 bracket that facilitates installation. You'll need an external case to attach the old drive to other laser printers that have SCSI ports.

Choosing That Drive

As previously noted, larger-capacity PowerBook hard drives are practically indistinguishable when it comes to performance, which explains why we award no Editors' Choice in this category. You must look to price, technical support, software bundles, and warranty when it comes time to make a decision. APS offered the largest selection of capacities and the lowest prices at press time. Unfortunately, although APS technical support has been more than satisfactory in the past, in our survey for this article the company did very poorly. If warranty is a concern, Microtech offers a full two years; all the other vendors include a standard one-year warranty. FWB's Hard Disk ToolKit is a nice package that retails for $199.95, but the FWB 120MB drive costs $280 more than its cheapest competitor, so this isn't a screaming deal.

If money is your major concern, you might consider purchasing a cheaper 3½-inch mechanism. The aggravation of lugging an external drive around is somewhat offset by the fact that the cost per megabyte is much lower. For example, the $569 Toshiba 213MB drive for the PowerBook from APS was the low-cost leader for this mechanism, with a cost per megabyte of $2.67. APS sells a 240MB Quantum 3½-inch drive in an external configuration for $399; that's only $1.66 per megabyte.

The best advice on picking out a new drive for your PowerBook is to watch the ads for the best deal. No matter which drive you choose to upgrade your PowerBook, you can be assured that you really can't go wrong with these drives. In an industry that always seems to be changing faster than we can keep up, that's a relief. m

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Contributing editor TOM NEGRINO recently took his own advice and upgraded the hard drive in his PowerBook 140.

BEHIND OUR TESTS

MW LAB The test platform that Macworld Lab used was a PowerBook 160 with 4MB of RAM; all power-saving features were turned off. For the low-level tests, we used a shareware program, SCSI Evaluator 1.07, to measure the raw read and write throughput of the drives. To simulate real-world use, we performed application-level testing, such as file duplication in the Finder, opening and saving an Adobe Photoshop file, opening and saving a large Aldus PageMaker file, searching in a 4th Dimension database, sorting a FileMaker Pro database, and opening large Microsoft Word and Excel documents.

To test the power consumption of these drives, Macworld Lab wrote an Excel macro that activated the hard disk installed in the PowerBook 160 every four minutes to enter data and save a spreadsheet. Using Apple's PowerBook control panel, we then set the drives to spin down after two minutes of inactivity. Our macro therefore exercised the drives through standby, spin-up, read, write, and idle modes. This cycle was repeated until the PowerBook automatically shut itself down when the battery was exhausted. We used the same screen brightness and contrast settings for each test run, and we set the CPU to rest after five seconds of inactivity. We conditioned the battery during each recharge, and charged the battery overnight. We measured an approximate time (plus or minus four minutes) of power usage for each drive.—**Macworld Lab testing supervised by Mark Hurlow**

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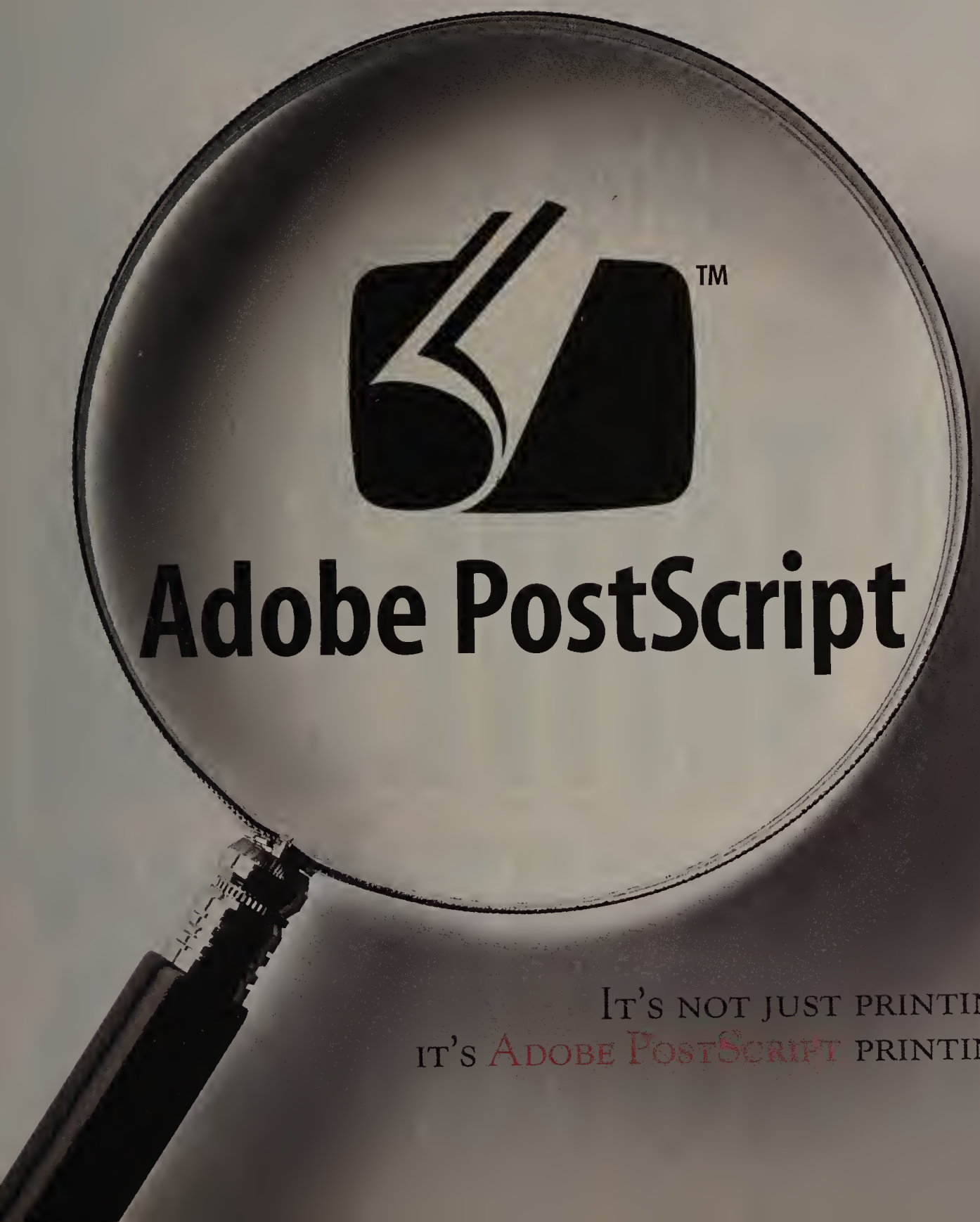

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A Road Map to MULTIMEDIA PRESENTATIONS

THREE WAYS TO CREATE A MULTIMEDIA PRESENTATION THAT'S ANYTHING BUT DRY AND DUSTY

BY JOSEPH SCHORR

The hype may imply that anyone can slap together a whiz-bang multimedia presentation in just a couple of hours, but the truth is that multimedia authoring is often as bewildering as it is irresistible. Choosing the ideal level of authoring program—one that is cost-effective, relatively easy to learn and to implement, and powerful enough to suit your needs—is challenging, especially with the spate of interactive media programs that have been rushed to market in recent months.

To explore the real-world dilemmas a new multimedia author might encounter, I invented the slumbering, dusty town of Weedpatch, Arizona. As the town's economic development director, I was suddenly responsible for promoting and revitalizing the dozing hamlet. I defined three multimedia authoring tasks: a persuasive business-style presentation designed to win the Weedpatch City Council over to my development plan; a computer-based promotional presentation for a booth at the state tourism convention; and most ambitious, an informational kiosk for the Weedpatch Visitor Center. With all of Weedpatch (population: 1283) counting on me to breathe new life into the small town's sagging econ-

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PETERS

omy, I fired up my Macintosh and went to work.

Deciding which applications were appropriate for the projects was the next problem. I chose six representative programs—two for each of the three projects. The programs ranged in complexity from simple slide-presentation tools to high-end applications used by multimedia professionals; prices ranged from a modest $399 to an extravagant $4995. (For a comparison of the specific multimedia features offered by each of the programs, see "Multimedia Authoring-Tool Highlights.")

First Project: Basic but Effective

I wanted to create a straightforward business presentation that had just enough color and pizzazz to make the city council sit up and vote yes. I created charts indicating proposed capital improvement, a graph with projected tourism revenues, and a few video clips of tourism professionals testifying to the validity of my plan for the town.

I didn't need much interactivity; mouse-clicks and key presses would do. And since I planned to narrate the presentation live, I didn't need extensive sound capabilities. I did want to include some of those attention-grabbing QuickTime video clips, however. Microsoft PowerPoint and Aldus Persuasion fit the bill for this project. Both programs support basic QuickTime editing, and PowerPoint lets you play back a loop of a movie that continues as long as the slide on which it is pasted is displayed.

Somewhat trickier is getting movies to play exactly when you want them to play. In PowerPoint, you don't have much choice—movies connected to a slide play as soon as the slide is displayed. Persuasion, on the other hand, allows you to place the movie on a slide layer; you can then set a time-delay between layers. Using this technique, I was able to create a slide on which first the Weedpatch logo appeared, then a paragraph of explanatory text, and finally, my video clip. The rich selection of transitional effects both programs offer—wipes, dissolves, reveals, and so on—kept my slide presentation from looking static.

Granted, this is multimedia at its least glamorous, but enhanced slide presentations are the approach most likely to be within the reach of users who want to try their hand at multimedia without a major investment in time and money. Like most projects of this type, my Weedpatch presentation had to be assembled on a tight schedule, and working with a familiar presentation-graphics program streamlined the production time.

Multimedia Authoring-Tool Highlights

Level	Product	Company	Phone	Toll-Free Phone	Price	Animation	Sound
Basic	Aldus Persuasion 2.1	Aldus	206/628-5739	none	$495	No path animation. Transitional effects can reveal slide layers one at a time.	No direct sound support, but sounds saved in QuickTime format can be inserted into any slide.
Basic	Microsoft PowerPoint 3.0	Microsoft	206/882-8060	800/426-9400	$495	No path animation. Titles can fly in from top, bottom, left, or right side of screen, but path and speed can't be edited. Transitional effects can reveal lines of text or objects on slide progressively over time.	No direct sound support, but sounds saved in QuickTime format can be inserted into any slide.
Intermediate	Astound 1.0	Gold Disk	416/602-4000	none	$399	Limited path animation allows objects to enter or exit slide in straight line only. Can specify duration (in seconds) of sequence or transition. Imports PICS animation clips.	Imports SND resources, as well as SoundEdit, SoundEdit Pro, AIFF, AIFFc, Amiga IFF, and Waveform Audio formats. Can load prerecorded sounds, record new ones, or overlay narrative on existing sound track.
Intermediate	Cinemation 1.0	Vividus	415/494-2111	none	$495	Records dragging, rotating, and resizing of objects for replay as sequence. Users can edit frames individually. Supports in-betweening. Imports PICS animation clips.	Imports SND resources and SoundEdit format. Can link sounds to particular frame or to button object.
Advanced	Authorware Professional 2.0	Macromedia	415/252-2000	800/945-4061	$4995	Full path-animation features include ability to drag text and graphics objects to any location on screen and play back movement in time-frame defined by user. Imports/exports PICS animations.	Imports SND resources, as well as SoundEdit and AIFF formats. Includes sound utility that modifies speed of recorded sound or records new sounds at a 22kHz sampling rate.
Advanced	Macromedia Director 3.1.1	Macromedia	415/252-2000	800/945-4061	$1195	Auto-Animate features ease rudimentary animation tasks; more-complex animations are created frame-by-frame or by in-betweening. Imports and exports PICS animations.	Imports SND resources, as well as SoundEdit and AIFF formats. If Macintosh is connected to MIDI instrument, can trigger MIDI sequences.

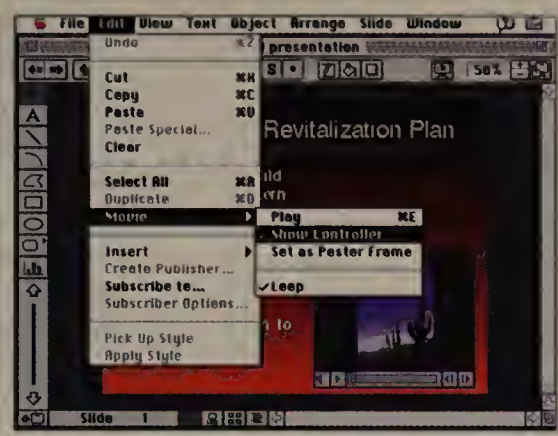
Second Project: Taking an Interactive Approach

The purpose of this project was to generate excitement about Weedpatch among travel professionals at a state tourism convention. I wanted to develop an interactive display for a booth that would include scans of color photos, a musical score, recorded narration, and an animated map of the area. It needed to include interactive buttons that would allow viewers to access information on local history, recreational opportunities, restaurants, and lodging.

It was important that this presentation exude style and panache. I didn't want viewers to merely read about Weedpatch's famous Bloodbucket Massacre of 1886, for instance; I wanted them to hear the gunfire and the screeching bray of horses and to see the Weedpatch Corral, where that historic gunfight took place. (Unfortunately, the site is partly obscured by LaVern's Burrito Emporium.) To pull this off, I needed a full-blown multimedia authoring program with support for sound, movies, path animation, and interactivity. There are several applications that could do the job, but I chose Gold Disk's Astound and Vividus's Cinemation as representative products.

Astound is one of the newest products on the multimedia scene and, happily, one of the simplest to use (see *Reviews*, in this issue, for more on Astound). The program itself has an outstanding interface that makes quick and easy work of creating gorgeous background gradients and animated titles. In addition, the hefty package (it comes on nine high-density floppy disks) contains a generous supply of clip media.

One of Astound's unique characteristics is that it allows you to create *time-based* animation. The sequences are all tied to the Mac's internal clock—not to a frame count. You simply specify the number of seconds you want a sequence to last, and Astound fits the motion to the allotted time. There are no frames to edit.



Adding Motion You can paste QuickTime movies onto a PowerPoint slide to add animation, video, and sound. You can even set the movie to loop for as long as the slide is displayed. You can also toggle a movie's sound track on or off and insert a movie with or without its controller bar showing.

Movies on Slides A tiny movie icon in the lower-left corner of a Persuasion frame indicates that a QuickTime movie has been pasted onto that slide. Clicking on the icon summons a menu that allows you to toggle sound and the movie's controller bar on or off.

Graphics	Movies	Interactivity
Imports EPS, PICT, Windows Metafile, and PICT II formats. Basic drawing tools included.	Pastes QuickTime movies onto any slide. Can layer movies so that they play after specified amount of time. No looping, but can cut and paste movie frames and adjust volume for each movie.	Mouse-clicks control pace for slides and layers. No branching to other segments of the presentation.
Imports PICT and MacPaint formats; imported images can't be moved or animated. Basic drawing tools include 24 shape tools that create arrows, stars, triangles, diamonds, and so on. Excellent gradients.	Pastes QuickTime movies onto any slide; movies play as soon as transition ends. If more than one movie on slide, movies play in order in which they are stacked. Plays movie once or loops it. Supports basic QuickTime editing.	Mouse-clicks control pace for slides and progressive disclosure. No branching to other segments of the presentation.
Imports PICT, GIF, PCX, BMP, EPS, Photo CD, and TIFF formats. Includes tools for drawing stars, arrows, and other common shapes.	Built-in QuickTime editor allows cutting and pasting of movie segments, adjusts volume and speed of movie, or sets movie to loop. Exports sequences as QuickTime movies.	On-screen buttons can trigger sounds, repeat sequences, or send user to another segment of presentation. Button tool creates 3-D buttons.
Imports PICT format only. Full-featured paint mode.	Playing QuickTime movie pauses all other actions. No tools for editing or modifying QuickTime movies. Exports sequences as QuickTime movies.	On-screen buttons can trigger sound or send user to another segment of presentation. Any object can be designated a button.
Imports PICT format only. Pastes other graphics from Clipboard or Scrapbook. Basic drawing tools.	Imports QuickTime movies but offers no editing tools.	Flowchart tracks interactions linked to buttons, custom menus, and text fields. Can monitor user responses such as button clicks, pointer movements, and text entered into data field.
Imports PICT and MacPaint formats. Full-featured paint mode.	Imported QuickTime movies can be centered and scaled. Exports sequences as QuickTime movies.	Interactivity requires use of complicated Lingo scripting language. Can add buttons, check boxes, and menus.

The program's stock transitional effects are among the best in any multimedia program. In particular, I was delighted with the rotation effect; it allows you to set a graphic object spinning in three dimensions as it slinks on screen and tumbles into place. The effect works splendidly, even on a sluggish old LC. (Unfortunately, the Rotation effect can't be applied to imported PICT graphics or text—only to shapes and lines drawn within the program.)

My one frustration with Astound is that its path-animation capabilities are limited to making objects enter and exit in straight lines; you can't move an object in a circular path, for instance, and you are limited to two path animations per object on a particular slide.

Cinemation is a hybrid animation/multimedia program. In Paint mode, it boasts a good selection of tools for creating objects; in Animation mode, you set the objects in motion. Cinemation is packed with features that automate the creation of frame-by-frame animated sequences. Once you place a graphic or text object on Cinemation's stage, for instance, you can rotate or resize an object or drag it along a path. Cinemation automatically records the changes frame-by-frame and plays them back as an animated sequence.

Because I wanted my travel conventioneers to be able to explore Weedpatch at will, I added buttons to several slides that played a sound or movie when clicked or that allowed the viewer to navigate to another area in the presentation. For example, I created one slide that opened with an animated sequence introducing the Bloodbucket Massacre of 1886. (Yes, this *is* Weedpatch's biggest claim to fame.) Three buttons on the slide allowed viewers to listen to a narrative of the event, to see photos of the tombstones on Boot Hill, or to watch a portrayal of "Wild Jeb" Gallagher, the swaggering outlaw whose outrageous deeds led to the fateful showdown.

Adding button interactivity was not complicated with either of the programs. In Cinemation, any object can act as a button; in Astound, you're restricted to a set of slick-looking three-dimensional button shapes, which can be modified slightly to suit your preferences.

In the end, I decided Astound's time-based animation (plus its superior sound and QuickTime capabilities) made it the better program for the project; even a relatively short animated sequence in Cinemation can involve working with hundreds of frames. There are many other good products in this category, which, like Astound, take a time-based approach to animation. Most notably, there are Macromedia's Action for Macintosh—a program similar to Astound, but with even more-powerful animation capabilities—and Passport Producer Pro 2.0, which now offers path-animation features and support for the SMPTE (Society of Motion Picture and Television Engineers) timing standard used in the video and broadcast industries.

Third Project: A Professional Presentation

The last project was clearly the most complicated. I wanted to create a self-running, interactive informational kiosk for the Weedpatch Visitor Center that would showcase the town's most salable attributes. Not so incidentally, I also hoped to record which features of the presentation drew the most interest from visitors. Besides scans of color photos and a musical score, I wanted to include animated maps and video sequences that featured nearby archaeological digs, Old West points of interest, public transportation options, and a special events calendar.

Both of Macromedia's higher-end programs—Macromedia Director and Authorware Professional—have steep learning curves and hefty price tags, but they offer the range of features I needed. Authorware's interactive capabilities go way beyond button-clicking, for example. Among other statistical niceties, the program can monitor the number of times visitors use pull-down menus or drag objects on the screen; it also records data entered into fields and performs calculations. I liked that both programs can use HyperCard XCMDs to control VCRs and CD-ROMs. Also, Authorware provides built-in support for videodisc players; through a simple dialog box you can program the range of videodisc frames to be shown.

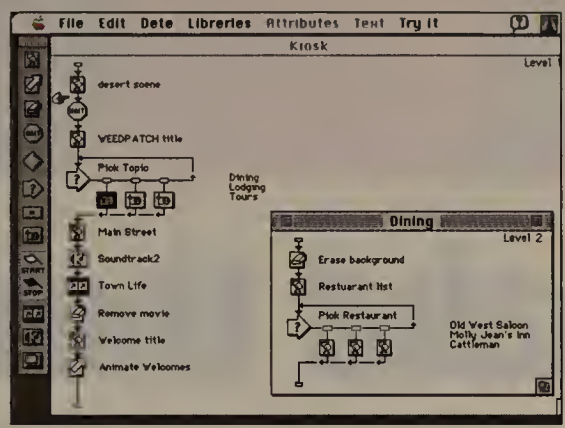
Admittedly, these programs can be intimidating. So, after briefly reviewing the documentation, I did what any responsible, level-headed economic-development director on a deadline would do. I explored the possibility of farming the job out. After a bit of research, I learned that most multimedia contractors spend about two to three months developing a presentation for a client—devoting at least a third of that time to planning and scripting the production. Also, most provide more than a finished presenta-

Drawing on Photos A digitized photo can serve as a most effective backdrop in an Astound presentation. In this slide, graphic elements such as the shadowed box and titling were added using the program's drawing and text tools. Astound offers basic path-animation capabilities and 18 transitional effects to control the entrance and exit of slide elements.

Suitable for Framing The main Cinemation window serves as the stage, while the individual frames making up the scene are visible in the Filmstrip window across the bottom of the screen. Animating the adobe graphic so that it grows from small to full-screen size involves simply dragging on an anchor point.

tion; they often throw in some training and consulting so that you can modify your final presentation on your own in the future. Professionally produced multimedia presentations are costly, however. Fees begin at around $10,000 and can run as high as $100,000 for a piece involving extensive interactivity and video footage. Municipal budget woes being what they are, I decided to take on the job myself.

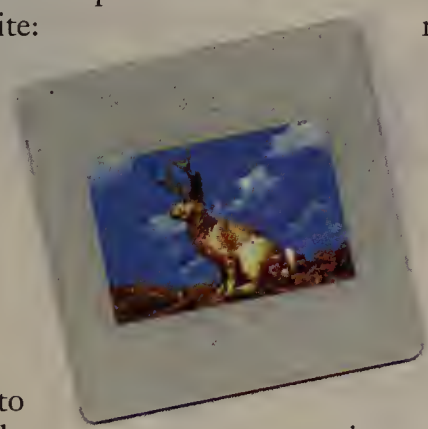
Authorware's construction metaphor is unique. Rather than building the production on a "stage," you build a flowchart, which serves as a kind of outline or map of the production. Each successive icon on the flowchart represents the next sound, graphic, or movie that will play. It's a somewhat cumbersome solution, but this approach does make it easy to include interactivity without learning a scripting language. If you want viewers to make navigation decisions, for instance, you just add branches to the flowchart.



Decisions, Decisions Authorware Professional presentations rely on flowcharts with icons representing such things as sounds, movies, and stills. In this example, an arrow-shaped Decision icon indicates that the presentation will pause until the user clicks on one of three on-screen buttons—Dining, Tours, or Lodging. The small window indicates a subsequence that plays when the Dining button is pressed.

All-Star Cast In Director, individual castmembers appear in the Cast window. To add a castmember to a scene, you drag it onto the stage, or main presentation window. Frame-by-frame animation was used to create this sequence in which an arrow zooms across the screen and zeros in on Weedpatch on a map of Arizona. VCR-like buttons on the Control Panel window (lower left) let you play and rewind sequences or view them frame by frame.

Director's scripting language, Lingo, is definitely complicated, but the program includes a number of features that make assembling high-quality animations surprisingly easy. For example, the Auto-Animate feature lets you create animated charts and text effects automatically; you simply type in the information, choose the style and the type of effect you want, and Director draws all the necessary frames. The Letter Slide effect, for example, easily slides characters into place one at a time for a professional, cinematic effect. In Studio mode, Director also functions as a straightforward frame-based animation program, complete with an elaborate set of painting tools. Combining Director's animation tools with its interactive capabilities produced some powerful results. My favorite: a colorful map showing the entire Weedpatch street grid—all seven blocks. When viewers want to know how to get from one point to another, animated arrows zip across the map pointing the way.



Picking the Right Tool

It is unlikely that a newcomer to multimedia authoring would be asked to create three diverse projects like the ones outlined here, but the issues raised mirror those encountered by anyone anticipating jumping into multimedia waters—money, time, desired level of sophistication, and necessary degree of interactivity.

Perhaps the most important point is to decide how sophisticated a program you need. Trying to coach a low-end product into generating a glitzy, interactive presentation can be as frustrating as wrestling with advanced features that you don't need.

Time is the next most important consideration. If you have only a day or two to learn the software and put the project together, and all you need is some basic QuickTime support, you'd best begin with basic slide-presentation software. Overall, I found PowerPoint made the leap into multimedia better than Persuasion—PowerPoint offers more options for QuickTime integration; its tools for setting up gradient backgrounds and transitions are easier to use, and its drawing tools are superior.

If you have a week or less to get up to speed and crank out that relatively full-featured presentation, Astound may be your ticket. You can grasp the basics in a couple of hours, but learning to use the interactive features well and mastering the use of transitional effects and animations requires more discipline. Cinemation, with its frame-based approach to animation, requires a bit more training. Once you're familiar with the mechanics of these programs, you can assemble a fairly complex presentation of average length in a couple of days.

Finally, both Director and Authorware require even more time. You can begin to string together the basic elements of a presentation within a day, but learning to construct complex logic models in Authorware or to use Director's scripting language requires a fair amount of practice. The multimedia experts I talked to said their designers generally spend three to six months with either program on a full-time basis before feeling they are truly proficient. If you're building a highly interactive presentation, schedule at least a few weeks to develop the program logic and to debug the presentation. Allot additional time for writing a complete script and assembling source media—video footage, recorded music, sound effects and narration, scanned artwork, and so on.

In any case, picking the right program will provide you with the basic tools you need to turn out productions of the highest quality. As for the galvanizing editorial content, fresh directorial style, and pure imagination found in the best multimedia productions—they don't come in a box. Those you have to supply yourself. **m**

Joseph Schorr is coauthor of *Macworld Macintosh Secrets* (IDG Books Worldwide, 1993). He lives in a remote Arizona town frighteningly similar to the imaginary Weedpatch.

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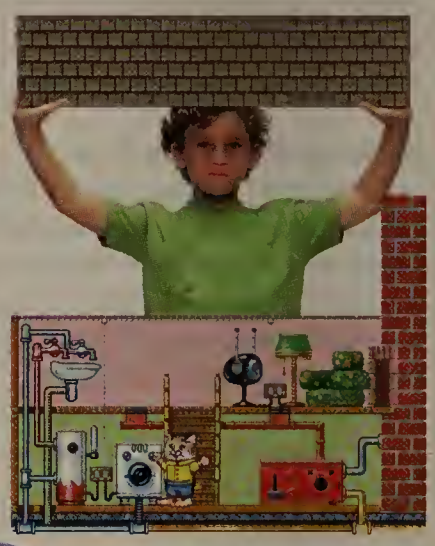

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SYSTEM REQUIREMENTS:
MACINTOSH: Macintosh LC or higher. 4 MB RAM. Color monitor. Hard disk (12 MB for full install, 6 MB for partial). System 6.07 or higher. CD ROM version requires CD ROM drive.
PC COMPATIBLES: 286 or higher (386 or higher recommended) 640 K RAM. Hard disk (12 MB for full install, 6 MB for partial). MS DOS 3.3 or higher. Mouse. Speakers. Soundboards: Sound Blaster, Sound Blaster Pro, Pro Audio Spectrum, Adlib, Tandy 3 or Disney Sound Source. CD ROM version requires CD ROM Drive.

Paramount Interactive

EDITED BY JAMES A. MARTIN

Graphics

THE LATEST IN DESIGN, PUBLISHING, AND PREPRESS

Scanning Color Images Made Simple

SCANNING COLOR IMAGES SHOULD become easier and more accurate, thanks to two software programs: Cirrus 2.0 from Canto Software and ScanPrep from ImageXpress.

Cirrus 2.0, a $395 scanning and image-enhancement program, automates a variety of scanning functions through menu items and support for AppleScript. The program ships with five scripts that automatically perform several predefined tasks; one script, for example, measures and scans an image, performs color calibrations and corrections, adjusts brightness and contrast, and saves the image as a file. You can also manually record the tasks you perform and save them as editable scripts.

Cirrus supports ColorSync; you can drop a ColorSync color-output-device profile onto any image, and the graphic automatically redraws on screen to reflect the color values of that output device.

In addition, the program features complete CMY (but not CMYK) and RGB color-space controls (brightness, contrast, gamma correction) and the ability to scan only selected portions of an image. Cirrus can also scan graphics directly into Cumulus, Canto's image-database program, and into QuarkXPress, Aldus PageMaker, or Adobe Photoshop via Apple events. Cirrus ships with scanner drivers for some 60 devices, ranging from flatbeds to drum and slide scanners.

According to ImageXpress, ScanPrep is the first smart-agent software for Photoshop—it's a plug-in module that takes control of Photoshop and its image-editing tools to obtain the best scanning results possible.

ScanPrep walks you through Photoshop's prescan settings by asking basic multiple-choice questions regarding the scanner and output device you're using, type of artwork being scanned, scanning mode, desired resolutions for input and output, and so on. ScanPrep uses that information to determine the best scanning settings. Once the image is scanned, the program's smart-agent processor takes over, making the postscan modifications to a duplicate of the scanned image and letting you compare the prescan and postscan versions.

ImageXpress plans to include profiles for about a dozen major scanner models with the first release of ScanPrep and expects to include additional profiles in the future. The company is bundling a 100-page scanning tutorial and a videotape of the company's Image '93 Scanning Workshops. ScanPrep is scheduled for release in October and will retail for under $500. Canto Software, 415/431-6871, 800/332-2686; ImageXpress, 404/564-9924.—CATHY ABES AND J.A.M.

GLENN MITSUI/STUDIO MD

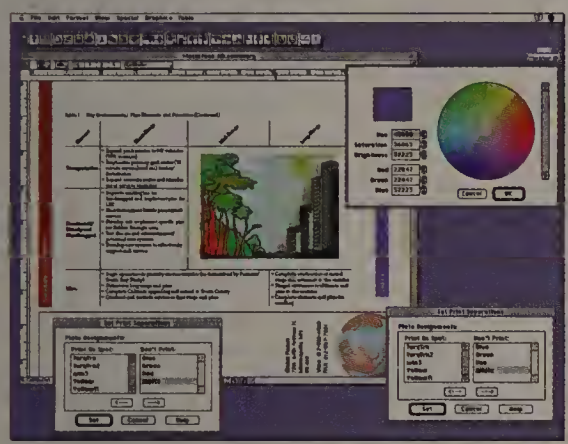
FrameMaker Fine-Tunes Its Color Support

FRAME TECHNOLOGY HAS UPDATED its cross-platform PostScript document publishing software, FrameMaker, with the ability to support four color models—RGB, HSL, CMYK, and Pantone. Previous versions of FrameMaker supported only eight spot colors; with FrameMaker 4.0, you can create documents containing images in any of the color models and print four-color separations of EPS and CMYK TIFF images.

Although its color support has been significantly upgraded, and the program

is now ColorSync-compatible, FrameMaker 4.0 still lacks a color-matching system—such as the EFI Color Profiles available in QuarkXPress 3.2. Nor does FrameMaker 4.0 offer trapping. A spokesperson for Frame said the program is aimed primarily at technical-document publishers, who don't require the same level of color support as QuarkXPress and PageMaker users.

Version 4.0 also offers a number of enhancements, including an icon tool bar



FrameMaker 4.0 offers enhanced color support.

for quick access to features and commands; a ruler that offers pop-up menus for text justification, line spacing, tab stops, and paragraph formatting; and the ability to view thumbnails. Other enhancements include text and graphics rotation in .001-degree increments; precise placement of mathematical equations; and support for QuickTime, Apple events, Multiple Master fonts, and publish and subscribe.

FrameMaker 4.0 is available now for Macs, Windows-based PCs, and Unix workstations. The Mac version costs $895; upgrading from version 3.0 is $199 (including one year of free technical support). Frame Technology, 408/433-3311, 800/843-7263.—J.A.M.

The Lowdown on ImageUp

NIQ IMAGEUP IS A $495 STAND-ALONE program that enables you to automatically place and print numerous graphics on a single page—a process that could save desktop publishers hundreds of dollars in proofing costs.

ImageUp acts as a kind of print queue. Drop image files into its Auto Add folder; when you tell it you're ready to print, ImageUp gathers, places, and prints the graphics. Provided the program is allocated sufficient memory (at least 7MB), ImageUp will perform those tasks in the background.

Using predefined page grids, ImageUp prints as many as 16 color images on one page—all of which are proportionally scaled and contain the appropriate resolution. You can also customize a page grid to print as many images as will fit onto a page. When a page becomes full, ImageUp automatically places the overflow graphics onto a second page. By comparison, you can't print more than one graphic file at a time in Adobe Photoshop—a process that is time-consuming and costly when you need to proof multiple images.

ImageUp supports TIFF, PICT, EPS, QuickTime, Kodak Photo CD, and Adobe Photoshop 2.0 native file formats. NIQ will release a minor upgrade to the program that supports Photoshop 2.5 files; the free upgrade should be available by the time you read this. You can also print multiple high-resolution images on one page from Aldus Fetch and other image-database programs via ImageUp. NIQ, 313/761-1236.—J.A.M.

IN BRIEF

■ **Upgrade to Fetch** Version 1.2 of Aldus Fetch enables you to preview text files, offers improved support for JPEG-compressed files, and can archive as many as 250,000 images per catalog. The upgrade is available at no cost to registered users; Fetch 1.0 costs $295. 206/628-5739.

■ **Seiko's Color Printers** Seiko is now shipping two PostScript Level 2 color thermal-wax printers for multiplatform networks; both are RISC-based. The ColorPoint PSN Model 4 ($5999) comes with 8MB of memory and provides letter-size printing; the PSN Model 14 ($8999) ships with 12MB of memory and provides tabloid printing. 408/922-5800.

■ **Photo CD Series** Corel Corporation is now shipping Corel Professional Photos, a series of 40 stock-photo CD-ROMs ($49.95 each). Each disc contains 100 royalty-free images in Kodak's Photo CD format and covers a specific theme, such as mountains and wild animals. 613/728-8200.

■ **Low-Cost Tablets** CalComp's DrawingSlate is a series of cordless graphics tablets for the Mac. The lightweight slates come in three sizes: 6 by 9 inches, 12 by 12 inches, and 12 by 18 inches. They range from $395 to $595 and connect via the ADB port. 602/948-6540, 800/458-5888.

ColorMaster Prints Both Sides Now

THE COLORMASTER PLUS XF—CALcomp's 300-dpi PostScript-compatible thermal-transfer printer—is the first color printer designed to let you manually print on both sides of a page (without damaging or wrinkling either side). Because of its double-sided printing capability, the printer makes it possible to produce full-color spreads and brochure mock-ups in-house, instead of having to spend extra time and money sending out to service bureaus for color proofs.

The ColorMaster Plus comes in two models: the 6603XF, which is geared for desktop publishing and business presentations and which prints 8½-by-11-inch pages, and the 6613XF, which handles oversize images up to 11¼ by 17¼ inches that can be cut to full-bleed 11-by-17-inch finished pages. Both models can print to a variety of media, including high-quality stock, thermal paper, plain

RICHARD RETHEMEYER

laser paper, and transparencies.

In addition to the Macintosh, the ColorMaster supports DOS PCs and a variety of Unix systems; with its autosensing feature, the printer automatically switches between serial, parallel, and AppleTalk ports.

The ColorMaster's 4MB of flash ROM makes it easily upgradable by floppy disk. It also supports SCSI-2 Fast for fast font downloading. Though the ColorMaster currently supports only PostScript Level 1, CalComp plans to send users a free upgrade to Level 2 later this year. The ColorMaster, which also includes a self-cleaning thermal-head ribbon, began shipping in July; the 6603XF retails for $5495, and the 6613XF, for $8995. CalComp, 714/821-2000, 800/445-6515.—CATHY ABES

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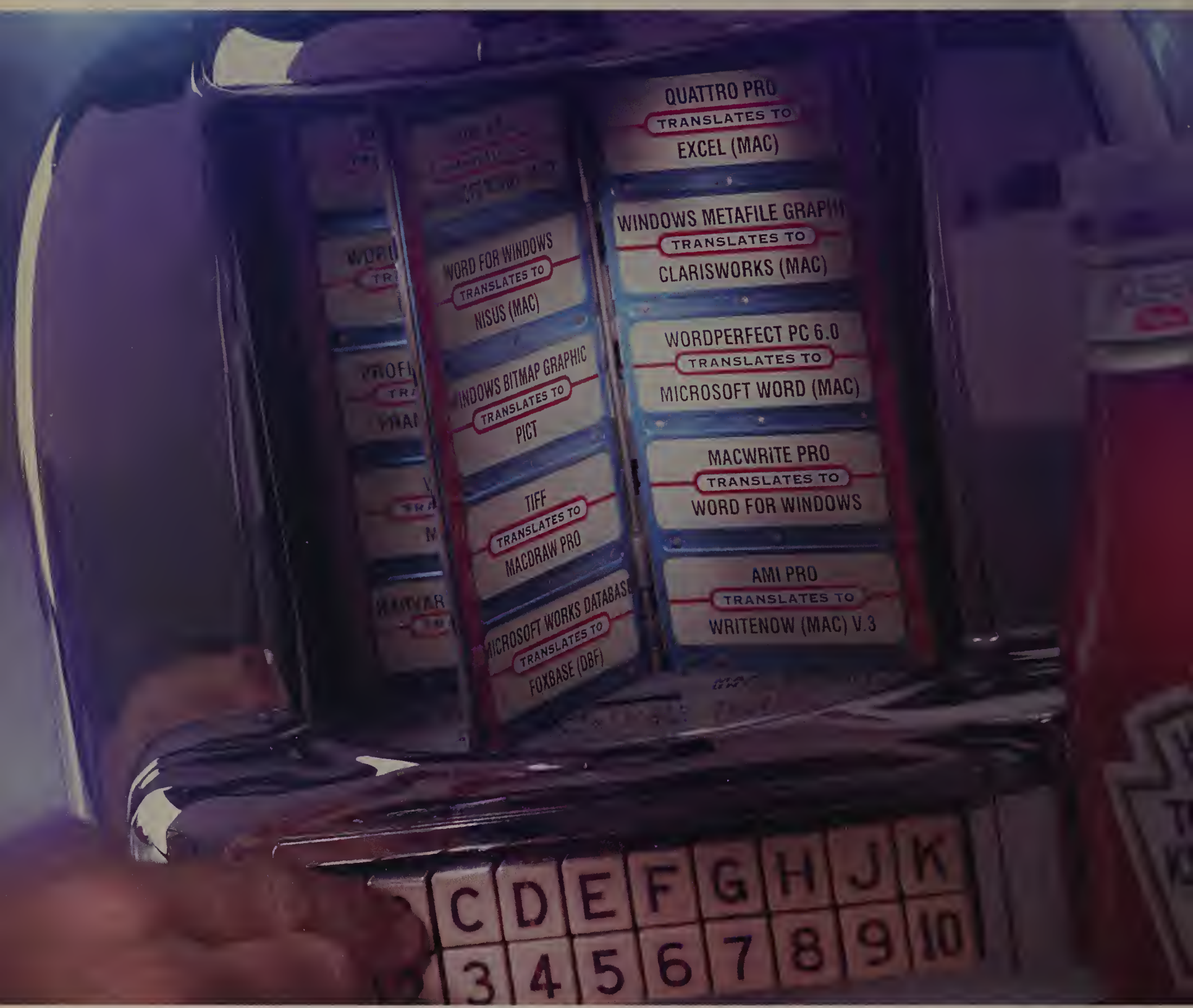

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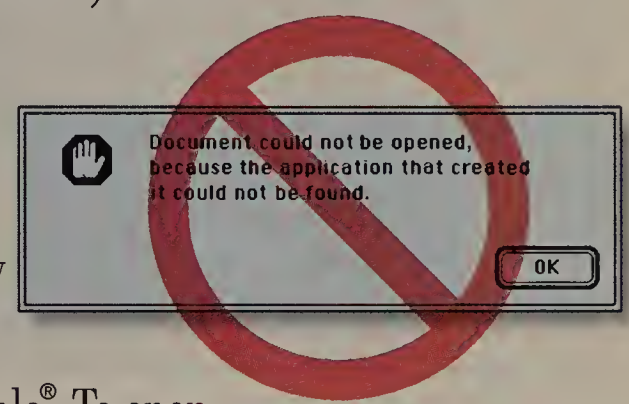

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Expert Graphics

GRAPHICS PROFESSIONALS SHARE THEIR SECRETS

by Cathy Abes

Artist: David Kahl is a free-lance illustrator and designer based in Hoboken, New Jersey. His clients have included *Newsweek*, Pantheon Books, and Harcourt Brace & Co.

How It Was Done: Kahl created this illustration for the *Networks* news section of our October issue. He began by scanning the textured background and giving it an uneven edge from scanned pieces of torn paper.

To create the gear with the face inside it, Kahl scanned an actual gear into Photoshop, where he reduced the saturated red, green, and blue areas (which are always picked up when scanning three-dimensional objects) to grays by setting the Saturation controls to –100.

Next Kahl removed the teeth on the right side of the gear by selecting everything but the teeth, inverting the selection, and deselecting the left side of the gear. Then he deleted the selection (the teeth on the right and the white background). He saved the entire gear as a mask (by selecting the white background with the magic wand and inverting it).

Next Kahl colorized the gear and applied the mosaic filter to the right side of the gear.

Kahl scanned the man's face from a vintage photo, retouched and resized it to fit inside the gear, and copied it to the Clipboard. Back in the gear file, he made a circular selection inside the gear, saved it as a mask, and loaded the selection. Then he pasted the scanned photo inside it.

To give the gear some depth and to make it stand out from the background, Kahl created a shadow to place behind the gear. He positioned the shadow slightly below and to the left of where he planned to place the gear itself.

To create the cable connector inside the small circle in the upper-right corner, Kahl first scanned the connector. Then he duplicated a circular area of the background, offset it, and inverted it. Finally, he pasted the connector into it and adjusted its position. m

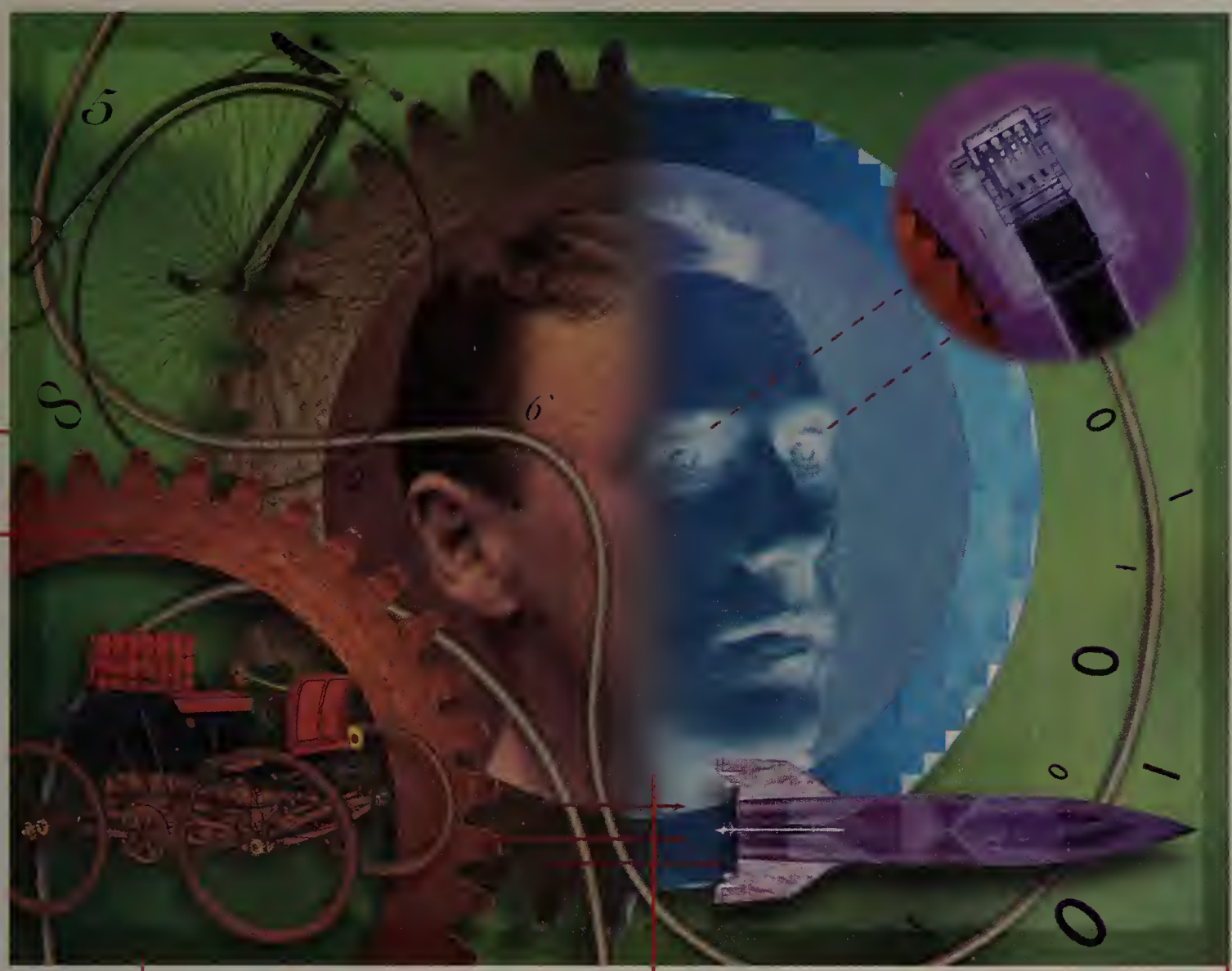
1 After scanning part of a photograph—a textured area that he would use for the illustration's background—into Photoshop, Kahl created an uneven border around the background by scanning small strips of torn paper and saving the scanned image as a mask. After loading the mask, he used Photoshop's Levels controls to darken the irregular edge of the border.

2 Kahl used Photoshop's elliptical marquee to select the circumference of the gear (excluding the teeth), dragging out from the center by holding down the shift and option keys. After inverting the selection so that only the teeth and the background were selected, he deselected the left side of the gear (using the rectangular marquee while holding down the ⌘ key). With the gear teeth on the right and the white background selected, he deleted the selection with the background set to white to remove the teeth.

3 With the entire gear still selected, Kahl created the pixelated texture on the right side of the gear. He deselected the left side with the rectangular marquee set to a 30-pixel feather to soften the edge between the left and right sides. With only the right side now selected, he applied the mosaic filter with a 20-pixel cell size and changed the color to blue with the Hue/Saturation command.

THE TOOLS

Hardware: Quadra 700 with 20MB of RAM and 2MB of VRAM; Mass Microsystems 210MB internal hard drive; Macintosh 16" Color Display; SyQuest 44MB removable-cartridge drive; Sharp JX-320 scanner.
Software: Adobe Photoshop 2.5.



4 To invert and change the color of the right side of the face, Kahl reloaded the mask and deselected the left side of the face (again with the rectangular marquee and a 30-pixel feather). He inverted the right side and adjusted the color with the Hue/Saturation controls.

5 To create the gear's shadow, Kahl used the Composite Controls to make the gear shape transparent, then saved the selection as a mask. To give the shadow a soft, diffused edge, he applied the gaussian blur filter (set to a 15-pixel radius). After loading the selection, he darkened it so that he wouldn't lose the background texture—by moving the Output Levels slider about halfway (a color value of 130).

6 To create the small circle in the upper-right corner of the image, Kahl selected a circular area of the background. While holding down the option key, he dragged a duplicate of the selected area slightly down and to the left to offset it from the original. Then he inverted the circle. The connector was scanned on a black background, selected with the magic wand, feathered 5 pixels, and inverted to give it an X-ray effect. Kahl then pasted the connector into the circle, where he rotated it into the proper position.

MW LAB

BY CHARLES SEITER

Low-Cost Color Scanners

Macworld Lab tests 14 flatbed scanners under $2000

Color flatbed scanners—once found almost exclusively in design shops and graphic arts departments—are on their way to becoming mainstream Mac accessories. With some models selling at street prices of $800 to $1000—and with software such as Light Source's Ofoto or Caere Corporations's Image Assistant, which are designed for novices—24-bit color scanners are now within the reach of many Mac owners for the first time.

You don't even have to do any desktop publishing to justify having a color scanner these days. Electronic publishing applications such as Adobe Acrobat and No Hands Software's Common Ground enable you to add scanned color images to documents and easily distribute them to both Macs and DOS PCs across a network. Also, you can include scanned color photos in on-screen presentations and multimedia projects. And with an optional sheet-feeder attachment and optical character recognition software, you can use your flatbed to scan text.

At these prices, with so many uses (and with software that steps you through the process), you may find that you can't live without a color scanner a moment longer. To help you find the best buy, we tested 14 color flatbed scanners that cost less than $2000. We scanned and printed both gray-scale and color images to see how the scanners handle image detail, color saturation, and color fidelity. We also considered preview and scanning speeds, scanner interface software, price, and the quality of tech support. (For more on our evaluation procedures, see "Behind Our Tests.")

How Scanners Work

Color flatbed scanners use a combination of lenses, lights, an analog-to-digital converter, and *charge-coupled device* (CCD) arrays to digitize artwork. CCDs contain a number of photo sensors, which convert the light reflected from (or through) a piece of illuminated art (an 8-by-10-inch color photograph, for example) into electrical charges. An analog-to-digital converter then translates the electrical charges into digital information.

During the scanning process, the scanner interprets white-to-saturate-red, white-to-dark-green, and white-to-dark-blue as separate 0-to-255 gray scales (also referred to as shades of gray). Thus, a 24-bit color flatbed scanner interprets up to 256 shades for each of the three primary colors: red, green, and blue. That translates to image files that contain 24 bits of color information per pixel.

There are two kinds of color flatbed scanners: *one-pass* and *three-pass*. One-pass scanners typically use three separate lights—one each for red, green, and blue—that flash on and off while scanning. Using this method, the scanner

Top to bottom:
La Cie Silverscanner II,
Hewlett-Packard ScanJet IIc,
and Mirror Technologies'
Mirror 800 Plus
Color Scanner.

head (which contains the CCDs) passes over an image only once to capture the RGB data. Three-pass scanners typically employ one lamp and three color filters; the scanner head moves across an image three times, once while the red filter is over the lamp, again while the green filter is in place, and again while the blue is in place.

Manufacturers of one-pass scanners often claim that their products scan faster than three-pass models, while three-pass scanner vendors have been known to assert that their devices capture sharper images than their one-pass counterparts. In general, however, our speed tests and scanning results don't support those claims.

The scanners tested for this article have *optical* horizontal resolutions ranging from 300 dpi to 600 dpi. Optical resolution is determined by a scanner's hardware, while *interpolated* resolution is generated through hardware and software. With interpolation, the scanner software creates additional pixels from the pixels generated by the hardware.

Horizontal resolution is ordinarily listed first. For example, a 400-by-800-dpi scanner has a horizontal, optical resolution of 400 dpi; the 800 dpi is the vertical resolution and is interpolated. In some cases, interpolated resolution is four times greater than the scanner's true optical resolution. Keep in mind that interpolated resolution can smooth the jaggies in line art or in scanned photos when enlarged, but it can't add a higher level of pictorial information to an image.

Who They're For

Any of these scanners can produce accurate 8-bit scans for each color, resulting in a 24-bit RGB color image. Their resolution is fine for screen presentations; low-resolution for-position-only images that are used as placeholders in page-layout spreads; and images used in brochures, newsletters, newspapers, office reports, and other documents destined for output on a 300-dpi color printer.

There are several reasons, however, why you wouldn't want to print glossy, dress-to-impress museum catalogs, magazines, or coffee-table tomes with graphics scanned on these flatbeds. First, many images have a wide *dynamic range*, or depth of colors, that can't be fully captured by a 24-bit flatbed. You need a high-resolution slide or drum scanner if you plan to output a transparency on a dye-sublimation printer or other device capable of rendering photo-realistic color. Second, many flatbeds are restricted to images no larger than 8.5 by 14 inches (most can't scan images larger than 8.5 by 11.75). Thus you're better off with a drum scanner if you need to scan various format sizes (if you can afford one, that is—drum scanners cost $30,000 and up).

Details, Details

The colors in a scanned image can seem out of sync with the colors in the original artwork (see "Comparing Color Output"). When that occurs, you can usually adjust the color to your satisfaction with an image-editing program such as Adobe Photoshop.

But when a scanner doesn't capture the fine details of an image, it's not so easy to fix. Most likely, the Sharpen command offered by many scanning software utilities and programs—used to improve focus and clarity—won't fill in the details of an image that weren't captured by the scanner hardware, and using the command can create contrast problems with other parts of the image. In fact, you may end up fussing around so much—sharpening some areas at the expense of others—that you drive yourself quietly dotty.

As a result, a scanner's effective resolution—the amount of image detail it captures—is one of the most important factors to consider before buying. Resolution is determined by the number of CCDs built into the scanner head, but the quality of a scanner's mechanics can vary among vendors. Thus, a scanner's claimed optical resolution doesn't always tell the whole story.

In our resolution tests, using both black-and-white and color images, we found little, if any, demonstrable relationship between a scanner's optical resolution and the level of detail in the scanned images it generates. Some images scanned with flatbeds that claim an optical resolution of 400 dpi (such as Umax Technologies' UC840 MaxVision)

Color Scanners Compared

	Apple Computer	Epson	Epson	Focus Enhancements	Hewlett-Packard	La Cie
Scanner	Color OneScanner	ES-600C	ES-800C Pro [A]	FocusScan 800C [B]	ScanJet IIc	Silverscanner II
Phone	408/996-1010	310/782-0770	310/782-0770	617/938-8088	208/323-2551	503/520-9000
Toll-free phone	none	800/922-8911	800/922-8911	800/538-8866	800/752-0900	800/999-0143
List price	$1349	$999	$1649	$1099	$1599	$1599
Scanning software included	Ofoto 2.02	Scantastic PS 3.0b20	Scantastic PS 3.0b20	ColorShop 1.3	DeskScan II A.1.62	SilverScan PS 2.0b
Additional software bundled	none	Adobe Photoshop LE	Adobe Photoshop 2.5, Kai's Power Tools	Adobe Photoshop 2.5 [F]	Adobe Photoshop LE	Read It, Color It [G]
One-pass or three-pass	one-pass	one-pass	one-pass	three-pass	one-pass	both [I]
Maximum scan area (in inches)	8.5 × 14	8.5 × 11.7	8.5 × 11.7	8.5 × 11.75	8.5 × 14	8.5 × 11.67
Top optical resolution [J]	300 × 300	300 × 600	400 × 800	400 × 800	400 × 400	400 × 800
Top interpolated resolution [J]	1200 × 1200	1200 × 1200	1600 × 1600	800 × 800	1600 × 1600	1600 × 1600
SCSI ID selector	button	dial	dial	button	dial	dial
SCSI termination	external	internal	external	external	external	external
Sheetfeeder option	no	$599	$599	no	$559	$699
Transparency option	no	$959	$959	$629	no	$999
Tech support rating	[L]	unacceptable	unacceptable	poor	very good	good

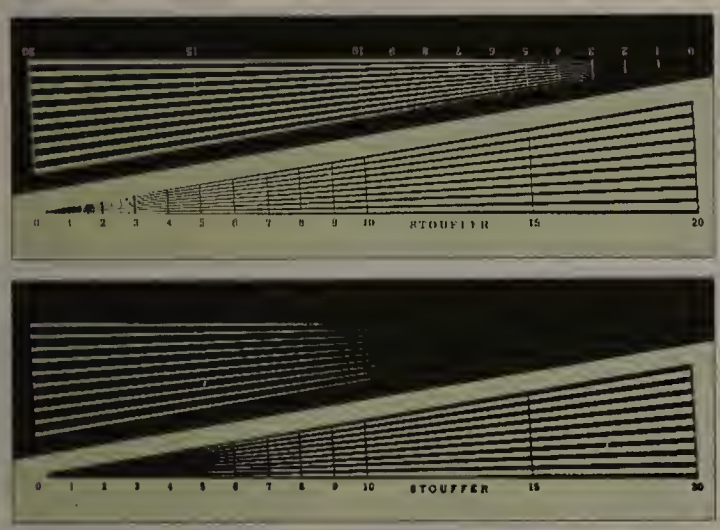
Technical-support ratings are based on a series of calls made to each company by Macworld staffers (posing as customers) to gauge the accessibility, helpfulness, and accuracy of the company's support technicians. Macworld uses a point system, including bonuses and demerits, to derive the final rating. Ratings are for companies, not individual products, and we call only those companies whose products Macworld Lab tests.

[A] The ES-800C-Custom for $1499 is the same scanner, but no image-editing software is bundled. [B] Focus sells two variations of this model. The FocusScan 600C with 600-dpi resolution costs $899; the FocusScan 1200C, with 1200-dpi resolution, costs $1799. [C] The ScanMaker II, at $949, is the same scanner as the IIXE but is bundled with Adobe Photoshop LE. [D] The Mirror 800 Pro Color Scanner is exactly the same, but it comes with a JPEG-com-

looked muddy when printed, for instance. Meanwhile, some scanners, including the Epson ES-600C, which modestly claim 300-dpi resolution, generated images that printed to the full resolution capabilities of a 300-dpi printer (see "Testing Resolution").

Images scanned on the Hewlett-Packard ScanJet IIc, the Tamarack ArtiScan models, Microtek's ScanMaker IIXE, Mirror Technologies' Mirror 800 Plus Color Scanner, and XRS Corporation's 12c OmniMedia Scanner displayed effective resolutions of 240 dpi to 280 dpi (based on the number of lines resolved from the target image). The images generated by the Umax scanners, Apple's Color OneScanner, and Focus Enhancements' FocusScan 800C revealed the least amount of image detail in printed output.

The bottom line: When buying a scanner—particularly if you plan to pay a bit more for a flatbed that claims optical resolution higher than 300 dpi—insist that the dealer run a resolution-target scan for you. Even though you're shopping for a color scanner, consider scanning black-and-white line art for this test, as resolution problems are much easier to spot in black-and-white than in complex continuous-tone color. Then print the image for evaluation; simply viewing it on a monitor isn't sufficient.



Testing Resolution In our resolution tests, scanners with the highest effective resolution, such as the Epson ES-600C (top), resolved the lines in the horizontal wedge all the way to the point. The Apple Color OneScanner (bottom) was among those we tested that couldn't resolve the lines all the way through.

Keeping the Noise Down

In addition to resolution testing, we also measured the amount of *noise*—or visible speckling within an image—these scanners generated. Essentially, our noise measurements were designed to test scanner consistency. For our tests, we scanned one color and one black-and-white image at the same settings three times each, and then compared the scanned images for noise.

As it turned out, all the scanners we tested produced some level of noise. This means you can expect to do some despeckling in an image-editing program on a scanned graphic with any of the scanners reviewed. Exactly which areas need despeckling, and by how much, will vary from scan to scan—even of the same image.

A Rose Is a Rose—Sometimes

To determine how accurately scanners reproduce the colors of an original image, we looked on screen at raw, unedited scans of a calibrated Kodak Q60 color-swatch test image with defined color values. We also devised a mathematical definition of *distance* in color space, essentially a measure of accuracy. The smaller the distance between the known color values on the swatch and the values we measured on the scans, the greater the accuracy; a bigger distance on this scale means more deviation from true color accuracy. The practical implications of the test have to do with calibrating and adjusting color gamma curves after an image is scanned.

HP's ScanJet IIc placed first in the color accuracy test. The scan's RGB values, on their measured scales of 0 to 255, are correct to within about 5 units of the expected values. Several scanners, such as those from Tamarack, Focus Enhancements, Umax, Apple, and Mirror, came close to HP's in color accuracy, showing RGB differences of 5 to 15 units.

But the measured values from scans generated by the Epson and La Cie scanners were significantly farther from the

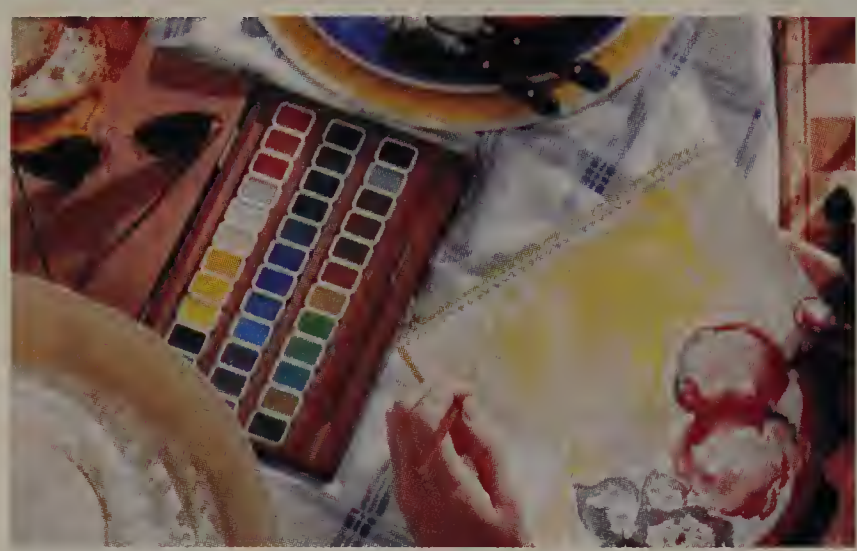
crotek	Mirror Technologies	Tamarack	Tamarack	Tamarack	Umax Technologies	Umax Technologies	XRS Corporation
nMaker IIXE [C]	Mirror 800 Plus Color Scanner [D]	ArtiScan 6000C	ArtiScan 8000C	ArtiScan 12000C	UC630 MaxVision	UC840 MaxVision	12c OmniMedia Scanner
)/352-3300	612/633-4550	408/956-0144	408/956-0144	408/956-0144	510/651-8883	510/651-8883	310/214-1900
)/654-4160	800/654-5294	800/643-0666	800/643-0666	800/643-0666	800/562-0311	800/562-0311	none
599	$1299	$1095	$1295	$1995	$1795 [E]	$1995	$1895
nMaker g In 2.0.4	MirrorScan 2.0.2	ColorShop 1.3	ColorShop 1.3	ColorShop 1.3	PS Plug-In 3.1	PS Plug-In 3.1	OmniMedia Plug-In
obe otoshop 2.5	Adobe Photoshop 2.5	Adobe Photoshop 2.5	Adobe Photoshop 2.5	Adobe Photoshop 2.5	Adobe Photoshop 2.5	Adobe Photoshop 2.5	Adobe Photoshop LE [H]
ee-pass	three-pass	three-pass	three-pass	three-pass	three-pass	three-pass	three-pass
× 13.5	8.5 × 11.5	8.5 × 11.7	8.5 × 11.7	8.5 × 11.7	8.5 × 14	8.5 × 14	8.5 × 13.5
) × 600	400 × 800	300 × 600	400 × 800	600 × 1200	300 × 600	400 × 800	300 × 600
00 × 1200	800 × 800	1200 × 1200	1600 × 1600	2400 × 2400	1200 × 1200	1600 × 1600	1200 × 1200
l	button	button	button	button	dial	dial	dial
ernal	external	internal	internal	internal	external	external	external
99	no	no [K]	no [K]	no [K]	$495	$495	no
99	$599	$595	$595	$595	$895	$895	built-in
or	very good	acceptable	acceptable	acceptable	unacceptable	unacceptable	acceptable

pression board and costs $1699. Mirror also sells a 300-dpi scanner, the Mirror 600 Plus, for $1099. [E] *Umax's UC630LE model costs $999, ships with Adobe Photoshop LE, but is otherwise the same scanner as the UC630 MaxVision.* [F] *Photoshop-scanner bundle costs $1299.* [G] *Other bundling options: Read It and Adobe Photoshop 2.5 or Letraset Color Studio, $1999; Read It, Color Studio, and Photoshop 2.5, $2099.* [H] *Full version of Photoshop costs an additional $400.* [I] *User can select between scanning modes.* [J] *Measured in horizontal dpi × vertical dpi.* [K] *Sheetfeeder option is scheduled to be available by November. No price was available at press time.* [L] *Company does not provide technical support.*

Comparing Color Output

Apple Color OneScanner

Epson ES-600C



Epson ES-800C Pro

Focus Enhancements FocusScan 800C

Hewlett-Packard ScanJet IIc

La Cie Silverscanner II

Microtek ScanMaker IIXE

Mirror Technologies Mirror 800 Plus Color Scanner

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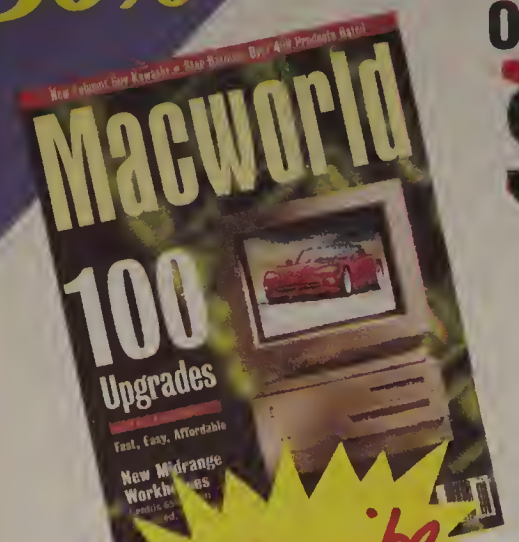

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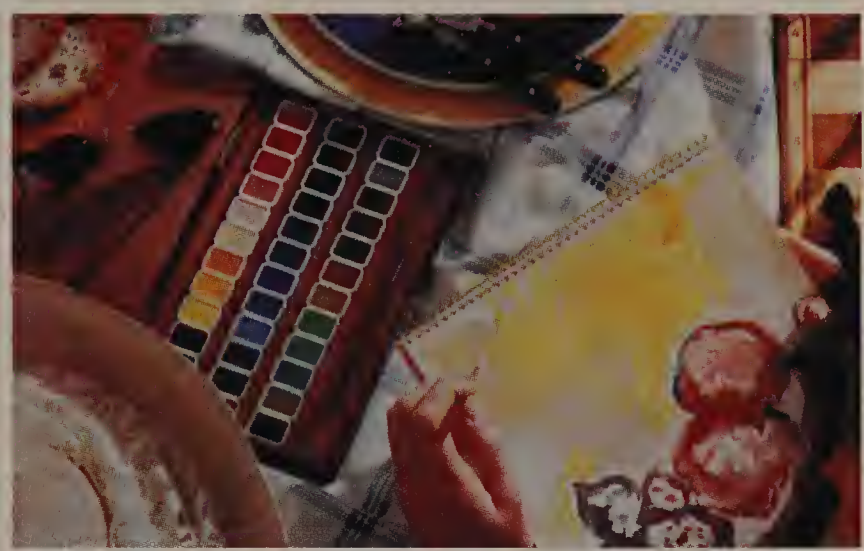

Umax Technologies UC630 MaxVision

Umax Technologies UC840 MaxVision

XRS Corporation 12c OmniMedia Scanner

Original image

In one of our tests, we scanned the same continuous-tone color photograph on each scanner and printed the resulting graphics on a dye-sublimation printer. *Macworld* judges then compared the dye-sublimation prints (shown here) with the original photo, without knowing which scanner generated the image. Among the things we looked for were color accuracy, color balance, and the amount of visual detail each scanner captured. The prints of the Epson ES-600C, Epson ES-800C Pro, and La Cie Silverscanner II scanned images were among our favorites, even though those scanners, in our color-accuracy tests, were among the least accurate. None of the scanners we tested were capable of producing highly accurate colors—notice the marked variations in the yellow on the painting, and the overstated red, or other, values (such as the hat in the Microtek image).

THIS SHOULD GIVE YOU
OF WHY WE CREATED AN

The image you see over there started out attached to the image you see over here. But as it made its way to the printer, the computer it was created on recognized a problem: 11 x 17 pages can't fit on 8½ x 11 paper.

And so, out came the electronic scissors.

Now, if you're like a lot of people, you know all about this routine. And you know how it feels to walk into a meeting with a presentation that contains hours of blood, sweat and tears, and a big fat strip of tape going right down the middle of it. Enough said.

COMPAQ PAGEMARQ Network Laser printers were built to help put an end to all of that. They can print 11 x 17 pages in a single pass. They come with up to three paper

trays, which lets you switch between paper sizes without leaving your desk, so you don't have to pull one paper tray out and replace it with another, only to have your neighbor

CONNECTIVITY OPTIONS

COMPAQ PAGEMARQ Printers can be directly connected into the following environments: NetWare, EtherTalk, LocalTalk, LAN Manager, LAN Server, Windows NT, and TCP/IP (including Sun, HP, SCO, IBM, DEC and lpd compatible hosts).

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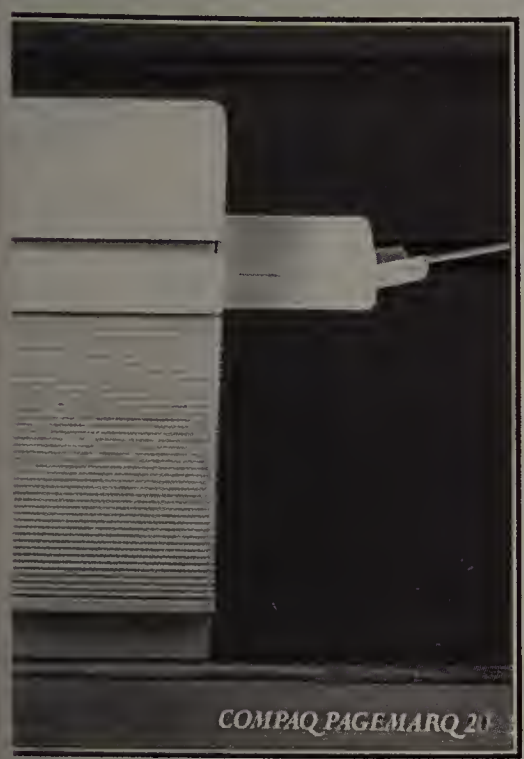
I A PRETTY GOOD IDEA
J 11 x 17 LASER PRINTER.

repeat the process two minutes later. They hold up to 1,500 sheets of paper. And for people whose design ambitions extend beyond Helvetica



Bold, PAGEMARQ Printers offer two ways to expand your type library, eliminating the need to continually download from your computer. You can add 1- and 2-MB Programmable Font Modules, or you can add an internal 60-MB Hard Drive.

All of which print with razor-sharp clarity thanks to the 800 x 400 dpi-high-resolution mode.

Of course, both the COMPAQ PAGEMARQ Laser Printers are fully backed by CompaqCare, our extensive service and support program. Which includes a one-year, on-site* limited warranty as well as unlimited toll-free telephone support. All at no additional charge whatsoever.

If you're interested in learning more, just call us at 1-800-345-1518 in either the U.S. or Canada.

We'll show you how to keep big ideas in one piece. At least until your client sees them. **COMPAQ**

A typographer's dream, these printers can store 1,500 fonts. Of course, not all of us dream about type. In which case, the 35 fonts that come standard are more than adequate.

Add an Internal FAX Modem and you can turn your PC into a personal fax machine. One that will send and receive true Adobe PostScript quality faxes in any size up to 11 x 17.

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Circle 20 on reader service card

EDITED BY DAN LITTMAN

At Work

THE LATEST TOOLS FOR BUSINESS COMPUTING

Fodor's Guide to U.S. Cities for Newton

A HYPERTEXT VERSION OF A FODOR'S guide to eight U.S. cities is among the first software planned for the Newton MessagePad, Apple's hand-held information device. Fodor's '94 Travel Manager: Top American Cities displays local and national maps and can draw the route from your Wall Street meeting to that stylish Fifth Avenue café—or from New York to Chicago. The Travel Manager also performs such tasks as creating a list of all the hotels in New York that accept Diner's Club and have a swimming pool.

Fodor's '94 Travel Manager: Top American Cities was created by Apple; the Fodor's group at Random House; and R. R. Donnelley GeoSystems, which provided the maps and routing technology. It will be a $119.95 PCMCIA card for the Newton's slot and should be available in late September or early October from Starcore, a new division of Apple that will publish Newton software.—D.L.

MARK JOHANN

Sonar's New Soundings

VIRGINIA SYSTEMS IS SHIPPING UPgrades that provide cross-platform capability and other new features for its document-imaging and text-archiving and -retrieval products Sonar 8.4, Sonar Professional 8.4, and Sonar Image 2.0.

In addition to allowing Macs and Windows systems to search each other's archives, the upgrades provide three fields for users to add a title, a date, and keywords to all stored documents. Documents retrieved by a query are ranked for relevance; a thesaurus is available to help users formulate queries; and the programs can execute and record AppleScript. Sonar Image's new ImageViewer can display scanned documents on screen.

For one user, Sonar is $295; Sonar Pro is $795; and Sonar Image, which includes Sonar Pro, is $1795. Multiuser pricing depends on installation size. Virginia Systems, 804/739-3200.—D.L.

European Stat Package Arrives

A MAC VERSION OF THE FRENCH-developed statistics program STATlab is coming to the States.

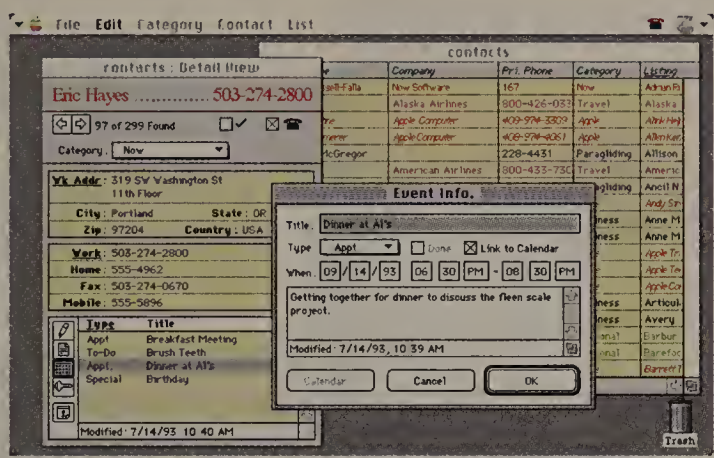
STATlab competes with SYSTAT and DataDesk (see "The Statistical Difference," *Macworld*, October 1993) and has some unique features. It can handle arbitrarily-large data sets; includes most popular exploratory-data-analysis graphics tools (such as boxplots; brushing, a way of selecting data displayed in graphs; and category-based coloring of data points); and offers a factor-analysis system that automatically recodes data for optimal analysis (factor analysis can run in the background while you use other STATlab tests). The program incorporates a data dictionary to keep track of how data is modified, and can import standard spreadsheet and database formats. A cartography menu with special map graphics makes STATlab particularly useful for marketing and social-sciences studies. STATlab should ship in October for $698 from SciTech International, 312/472-0444.—CHARLES SEITER

In Contact with Up-to-Date

NOW SOFTWARE IS CREATING NOW Contact, a contact-manager mate for its calendar program, Now Up-to-Date. Besides normal contact-manager features, Contact will have a full-blown word processor that does mail merges, and will be able to link external documents to records. You will be able to create new layouts, assign people keywords for easy retrieval, and group people in categories.

A revision of Up-to-Date will give the two programs closer links than any calendar-and–contact-manager combo now available. For example, a meeting scheduled from inside Contact when Up-to-Date is not running will be imported the next time Up-to-Date runs and checked for conflict with other events; if necessary, the programs will warn you.

Now Contact will list for $99 and should ship before the end of the year; a compatible version of Up-to-Date should ship at the same time. Now Software, 503/274-2800.—D.L.

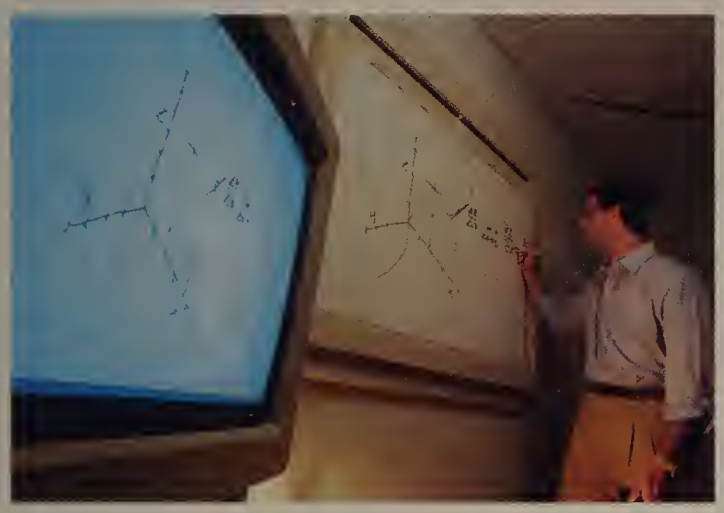


Now Contact's list and record views. The Event Info box shows an event linked to Now Up-to-Date.

Digital Whiteboard

SO VIDEOCONFERENCING MAKES YOUR CFO turn bright red and start breathing funny—but you still need to brainstorm with the techs on the coast? Check out the Softboard, a 54-by-60-inch whiteboard that plugs into your Mac's serial port. Lasers in the Softboard's frame sense the movements of standard dry-erase markers fitted with reflective collars, and its software transfers your sketches to a drawing window on the Mac. Use the reflective-ringed eraser, and the appropriate space is cleared on the Mac. You can hook up two Softboards over phone lines, and what you draw on one is instantly transmitted to the other Softboard's Mac.

The Softboard recognizes four different pen colors and can save drawings as PICT files. The Softboard will be available in November from Microfield Graphics for $2995. 503/626-9393. —CAMERON CROTTY



The Softboard transcribes marks you make with a felt pen into graphics on a computer. (The model shown is a prototype; the full-size version was not ready to photograph at press time.)

TREND

How to Be a Better Boss

MANAGEPRO BELONGS TO AN EMERGING class of software that supplements tools for performing a particular task with a knowledge base that helps you perform the task well (for another example, see "Planning to Negotiate" in *At Work* news, October 1993).

ManagePro publisher Avantos Performance Systems describes the program as "a turnkey real-time support system for managers." The program has two linked parts. One leans toward project management, with tools for setting up tasks, delegating them, and tracking their progress. The other part focuses on people, showing who is working on what and how well they're performing. ManagePro reminds managers to conduct performance evaluations and provides a place to record the results, makes suggestions for coaching and rewarding employees, and when questions arise, provides context-sensitive advice based on the writings of management experts. ManagePro is multiuser.

ManagePro's first Mac version, 2.0, should ship this fall for $395 per user. Avantos, 510/654-4600.—D.L.

IN BRIEF

■ **CoStar Updates LabelWriter** CoStar is opening the software for its LabelWriter II label and envelope printer to allow 4th Dimension, Omnis, and other programs direct access to its capabilities. For end users, the new version, 2.0, has more control over templates; a fast, non-WYSIWYG data entry mode; and background printing. It should ship in September. The LabelWriter II and LabelWriter II Plus, with a bigger print head for printing bigger labels, list for $249.95 and $299.95, respectively. CoStar, 203/661-9700.

■ **American Heritage Dictionary on CD** WordStar is putting the *American Heritage Dictionary*, third edition, on CD-ROM along with Roget's II Electronic Thesaurus. The CD contains a 200,000-word 16MB version as well as a 100,000-word 6MB version, which can run on the CD or be installed on a hard disk. Users can search definitions and do anagram and wild-card searches. The CD should ship this fall. Price was not set at press time. WordStar, 415/382-8000.

■ **Newton Means Business?** Two major accounting software vendors are developing business products for the Newton MessagePad. Great Plains (701/281-0550) is developing Personal Time & Billing, intended for lawyers, accountants, and others who charge by the hour; its price and ship date are not set. State of the Art (714/753-1222), which recently announced high-end accounting products and acquired Accountant Inc. (now called Mac-P&L), is developing a product for recording expense-report information while on the road. Its name, price, and ship date are not set.

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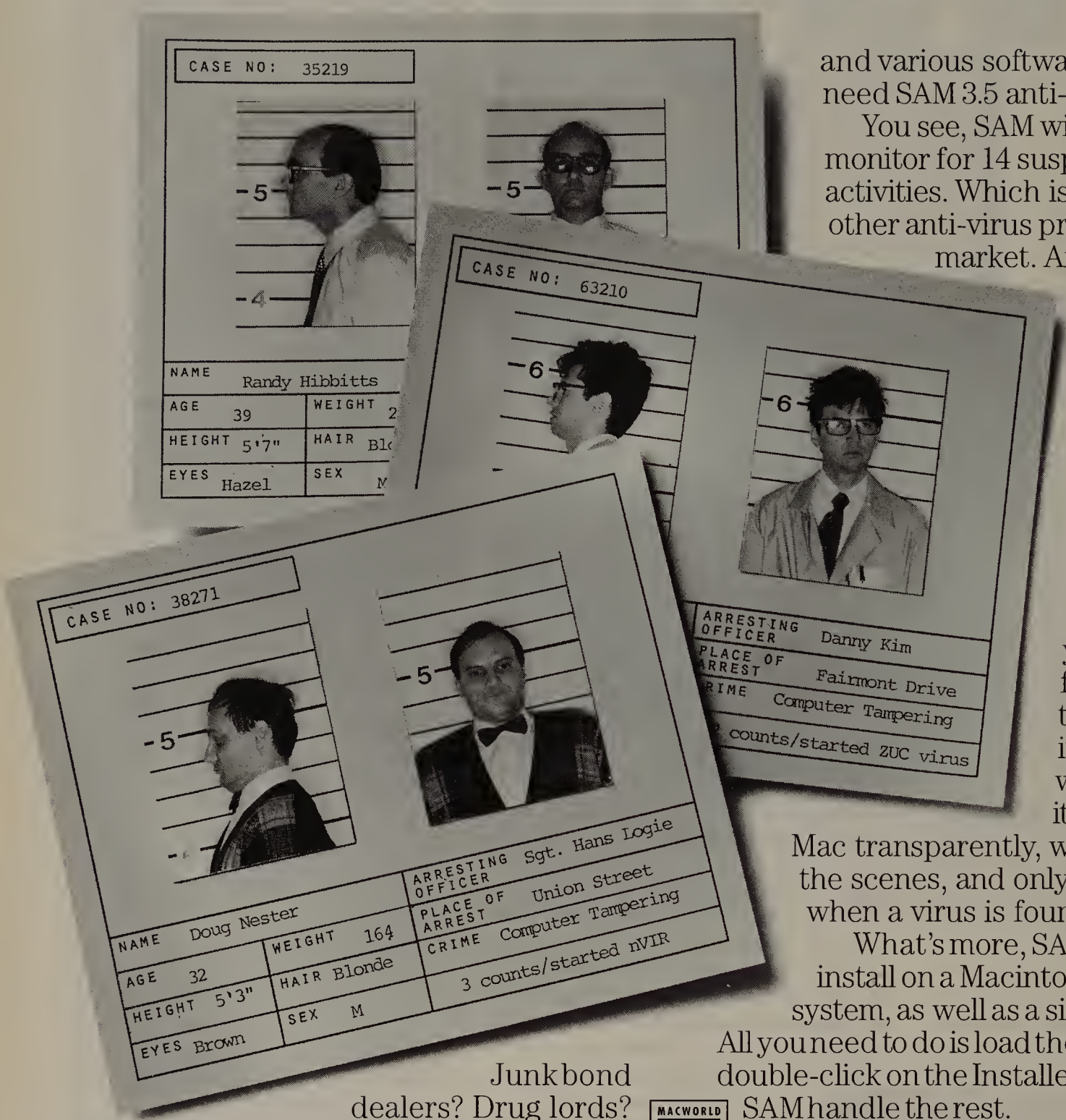

Junk bond dealers? Drug lords? Savings and Loan presidents?

Nope, they're computer hackers. And judging by their physical appearance, you wouldn't think you'd need any protection from them. But you do. Or should we say, your computer does.

And to keep these criminally minded people from infecting your files, floppies and various software programs, you need SAM 3.5 anti-virus software.

You see, SAM will constantly monitor for 14 suspicious viral activities. Which is more than any other anti-virus program on the market. And it's the only program that will scan compressed files in System 6.0 and 7.0.

So basically, if your Mac has a virus, SAM will detect it, get rid of it and repair the file. And if your Mac is virus-free, SAM will help to make sure it stays that way. Because it monitors your Mac transparently, working behind the scenes, and only interrupting when a virus is found.

What's more, SAM is simple to install on a Macintosh networking* system, as well as a single-user Mac. All you need to do is load the program disk, double-click on the Installer Icon and let SAM handle the rest.

For the most anti-viral protection, pick up SAM 3.5 at your local retailer. It's the most popular anti-virus program in the world, and will keep you from ever having to deal with this ugly crime. Or these ugly criminals.

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BY JIM HEID

Working Smart

Professional Word Processing

BACK IN THE OLD DAYS, WHEN YOU needed a freshly typed document you gave it to one of the gals in the typing pool. The typing pool has since been drained dry and, gal or guy, you're probably preparing your own documents. That means learning the tricks of the text processing trade—and mastering the time-saving features your word processor provides.

This month I examine how to use several of the most popular Mac programs—Microsoft Word 5.1, WordPerfect 2.1, Nisus 3.4, and MacWrite Pro 1.0—to meet the needs of business word processing tasks. "Word Processing Accessories" spotlights add-ons that can enhance your Mac's word-slinging capabilities.

Finding Your Center

How many times have you printed a one-page memo or letter, only to find your salutation on top of the letterhead? Adding blank lines at the beginning of the document to vertically center it fixes that problem, but creates another: when you edit or reformat the document, the letter isn't centered anymore. They can send a man to the moon—can't they make a word processor that vertically centers a one-page letter?

Yes, they can. WordPerfect's Center Page command does the job in one step. With the blinking insertion point located anywhere on the page, open the Page submenu (in the Layout menu) and then choose Center Page. That's easy.

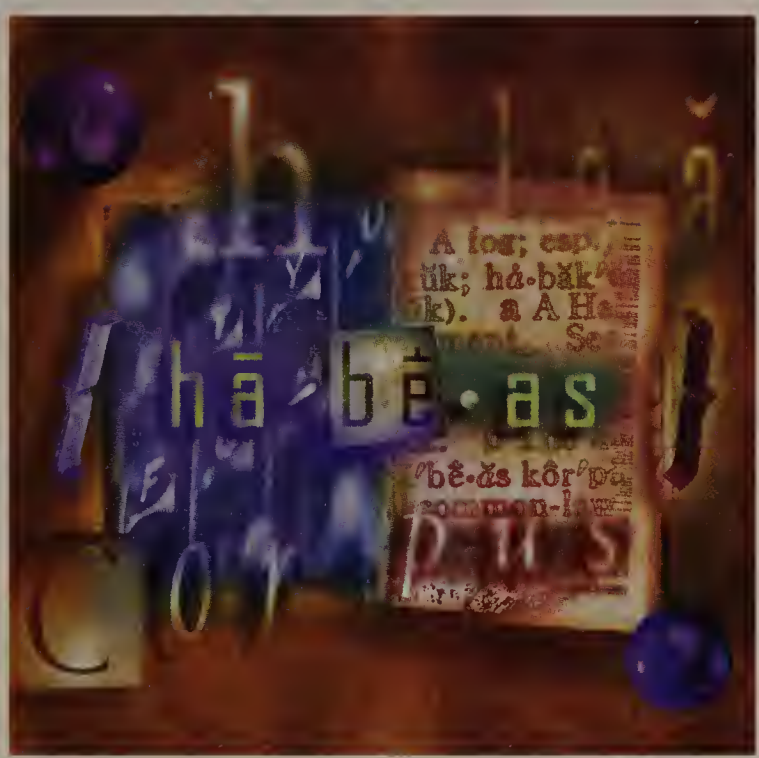
Microsoft Word's Frame command is intended for fancy tasks like creating sidebars and positioning graphics, but you can also use it for this common chore. Select the entire document and choose Frame from the Format menu. In the Vertical area of the Frame dialog box, choose Center from the left-hand pop-up and Page from the Relative To pop-up. If you work in Word's Page Layout view, you may notice delays during editing as Word works to keep the text centered, so after applying this technique you might want to work in Normal view only.

Consider creating a style sheet for your centered-on-page format. Make the style sheet available to all documents by adding it to the Work menu, and you can vertically center letters with one mouse-click. (For details on styles, see *Getting Started*, *Macworld*, March 1993.)

Remember that all four programs let you create stationery documents that retain boilerplate formatting and even text. If you routinely use a certain type of document—whether a 1-page memo or a 100-page manual—creating stationery for it gives you a head start the next time.

Making and Tracking Revisions

In many businesses, documents must run the approval-loop gantlet, with everyone adding his or her two cents' worth. *Revision-tracking* features make it easy to spot the text that has changed since the last go-around.



The most useful revision-tracking feature is the ability to display vertical *change bars* in the margin next to altered text. Sometimes called *redlining*, these bars enable readers to scan quickly for new or edited text.

For some reason or other, no Macintosh word processor can automatically create change bars while you are working. Therefore, you need to manually indicate new or changed text by choosing a command—an easy step to overlook when you're on deadline and frantically making changes. In WordPerfect, choose Redline from the Style menu. This adds a change bar (which is red on color monitors) adjacent to the line containing the blinking insertion point.

Microsoft Word is even clunkier. You have to create a paragraph border by choosing the Border option from the Format menu and clicking on the left edge of the border sample. This adds a change bar to the entire paragraph—not exactly an ideal solution, but serviceable. To streamline the creation of change bars, add the command for a left paragraph border to Word's Format menu: choose Border, press ⌘-option–plus sign (+), and then click on the left edge of the border sample. The Format menu now contains a command called L Single Paragraph Border. (To add a command for removing borders, go through the same process but click on the None option under Line in the Border dialog box.)

If you're willing to introduce another program and another step to your revision tracking, consider Advanced Software's DocuComp II. This program compares two files and shows you on screen the differences between the two with strikeovers, bold formatting, and so on. DocuComp II can also create a combined document that details the differences between the two versions. DocuComp II can open Word, WordPerfect, and text-only files. Nisus, by the way, has built-in document-comparison features, including the ability to synchronize two windows so that when you scroll one, the other tags along.

continues

Electronic Annotations

Word 5.1 and MacWrite Pro offer online annotations—electronic Post-it notes that you attach to documents. This is handy for adding comments without fouling the document's text, but readers might not notice the small icons that indicate annotations. Another problem: annotations don't print when you print the document. The beauty of real Post-its is that you can have them stick out like flags—electronic annotations are too unobtrusive.

The ultimate in online annotation tools is Mainstay's MarkUp 2.0, which lets you electronically scrawl comments and note insertions and deletions—complete with standard proofreader's marks (see "Marking It Up"). MarkUp lets you set up a separate layer for each person who reviews the document. You can then choose which layers you want to view.

I'm not a big believer in electronic document annotation. If your documents travel within a single physical location, I say mark them up with pencils and Post-its. But if you send them to other locations using electronic mail or remote-access network software, electronic annotations are worth considering.

Numbering Lines and Paragraphs

Legal documents often have numbers running down the left margin to allow for quick reference. Microsoft Word, WordPerfect, and Nisus can add these numbers automatically.

To create line numbers in Word, choose Section from the Format menu and then click on the Line Numbers button. The dialog box that appears lets you number lines by page, by section, or continuously throughout the document. You can also choose the interval to number—say, every fifth line. The From Text box lets you specify the distance between line numbers and the lines they number. To turn off line numbering for certain lines, select them, choose Paragraph from the Format menu, and select the Suppress Line Numbers option. To place a vertical line between the text and the line numbers, use the Border command. To change the font and size of line numbers, edit the style named Line Numbers.

In WordPerfect, place the insertion point where you want numbering to begin or select the text you want to number. Open the Line submenu (in the Layout menu) and then choose Format. In the Line Format dialog box, choose Continuous or Restart Each Page and specify any other options, such as the numbering interval. If you want a vertical line between the numbers and the text, draw it using WordPerfect's drawing window.

Nisus's line numbering is the best. With the Line # Prefs command (in the Display subcommand under the Tools menu), you can display and reformat line numbers and choose from two styles of vertical separator lines. Nisus is also the only program of the three that shows line numbers in position—no choosing Print Preview and squinting at a tiny page to see if the numbers are right.

Lawyers can benefit from several other word processor features. Print merge, normally used to create personalized form letters, can be a handy way to combine boilerplate contract text with the names of each party (for more on merg-

continues

WORD PROCESSING ACCESSORIES

There are dozens of software add-ons that can enhance your Mac's word processing capabilities.

Look It Up

Can your word processor spell *thrombocytopenia?* Or *habeas corpus ad subjiciendum?* Or *nondiversifiable?* Or *3-ethoxy-1,3-pentadiene?* You can expand your word processor's vocabulary by adding specialized dictionaries. Nisus Software sells medical and legal dictionaries for its programs. For Microsoft Word, the best source for custom dictionaries is Alki Software, which distributes expanded dictionary and thesaurus packages licensed from Microsoft. Alki's Comprehensive Spelling package adds 74,100 medical, legal, business, financial, and insurance terms, and Alki's Comprehensive Thesaurus has 600,000 words. Alki also sells 14 foreign-language packages that contain standard spelling and hyphenation dictionaries and a standard thesaurus. And Medina Software sells a Word dictionary of biblical proportions: the Medina Spelling Dictionary contains biblical names, locations, abbreviations, and other biblical terms—along with, oddly, a variety of computer industry, medical, and electronics terms. Medina's Correctamente is a Spanish spelling dictionary for Word.

Spelling Checkers

If adding new dictionaries isn't enough, you can replace your word processor's spelling checker altogether with a third-party program such as Working Software's Spellswell 7, Deneba Software's Spelling Coach Professional 3.0.6, or Baseline Publishing's Thunder 7. Spellswell accepts the largest array of add-on dictionaries—medical, legal, geographical, science, and business.

Spellswell is also unique among add-on spelling checkers in that its extensive support for System 7's Apple events mechanism allows Spellswell to check files from any application that understands the Apple events word services suite—not just from a word processor.

Thunder 7 and Spelling Coach Professional each have their strengths, too. Thunder 7 records your keystrokes to protect against work lost due to system crashes, and it has a glossary feature for storing and recalling frequently used text. Spelling Coach Professional includes numerous specialized dictionaries and provides terse definitions. Both programs can also check spelling as you type—something Spellswell can't do (nor can any word processor).

File-Translation Utilities

If you swap documents with DOS PCs, you can minimize file-transfer hassles by standardizing on a word processor that's available on both platforms, such as WordPerfect or Microsoft Word.

If that's not possible, you can fall back on a translation package such as Mastersoft's Word For Word Macintosh. Word For Word supports dozens of file formats and includes Apple's Macintosh Easy Open extension, which eliminates the annoying "application not found" error message that appears when you double-click on a PC document's icon.

WHERE TO BUY

Comprehensive Spelling, Comprehensive Thesaurus $79.95 each; foreign-language spelling and hyphenation dictionary with thesaurus $99.95 (available in 14 languages); Alki Software Corporation; 206/286-2600.

Fair Witness 1.2.1 $295; Chena Software; 215/770-1210.

MasterWord 5.1.2 $99.95; Alki Software Corporation; 206/286-2600.

Medina Spelling Dictionary 1.0 $16.95; **Correctamente 2.0e** $32.95; Medina Software; 407/260-1676.

Spelling Coach Professional 4.0 $195; Deneba Software; 305/596-5644.

Spellswell 7.0.3 $74.95; Working Software; 408/423-5696.

Thunder 7 1.5.3 $99.95; Baseline Publishing; 901/682-9676.

Word For Word Macintosh 1.2 $149; Mastersoft; 602/948-4888.

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MacFriends Hot "Macroeconomics" Tip # 14
MACFRIENDS RATED
BEST BUY
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Bank on the value of the Centris 610!
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• 160MB HD • 14" Color Monitor
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ing, see *Getting Started*, *Macworld*, April 1993). Glossary and macro features let you insert boilerplate text easily.

WordPerfect provides features that streamline creating a table of authorities—a kind of bibliography that lists the cases cited in a legal brief. The process is too complicated to describe here, but briefly (pardon my pun), it involves marking each citation, choosing a location and formatting style, and then generating the table of authorities.

Word's Renumber command (in the Tools menu) provides paragraph-numbering and renumbering features that make it easy to create numbered lists, such as instructions in a manual. To number a series of steps, type a number—any number—in front of each step, select the steps, and choose Renumber. Select the Only If Already Numbered option.

You can also use Word's Renumber command to automatically number an outline in standard outline style. After creating the outline, select it and choose Renumber. In the Renumber dialog box's Format text box, type **I.A.1.a.i.** In the Numbers area, select the 1.1 button, and then click on OK.

Cleaning Up Downloaded Text

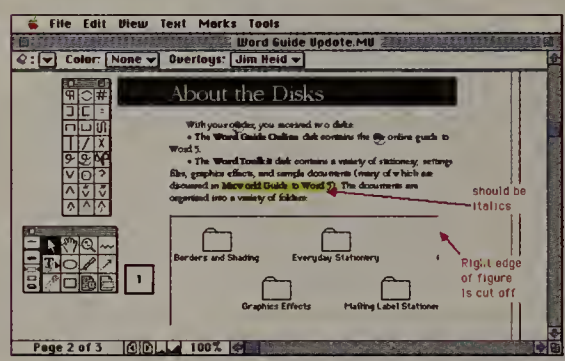
Text that comes from online services or a minicomputer or mainframe often needs reformatting. Communications programs generally put a carriage return at the end of every line, defeating the automatic word-wrap feature that sets word processors apart from typewriters. To avoid manually replacing each return code with a word space, use your program's search-and-replace feature.

To replace carriage returns with word spaces in Word, type **^p** in the Replace dialog box's Find What box and a space in the Replace With box. Click on the Replace button to change a carriage return, and click on Find Next to retain carriage returns that actually separate paragraphs.

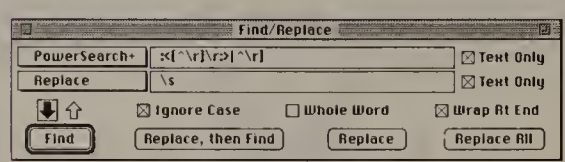
The process is similar in WordPerfect. In the Find/Change dialog box, choose Hard Return from the Insert menu. Then alternate between the Find and the Change then Find buttons.

For sheer search-and-replace power, you can't beat Nisus, whose PowerSearch+ feature is unmatched among Mac word processors. To change return codes within paragraphs into word spaces, configure Nisus's Find/Replace window as shown in "Power Searching with Nisus." Then simply click on Replace All.

A terrific utility for massaging downloaded text is Open Designs' Word Wrapper. Word Wrapper automates the search-and-replace scenarios I've just outlined and goes beyond them to provide additional ways of tweaking text for easier reformatting. The program is simple and straightforward, but if you work with downloaded text often, Word Wrapper could save you hours of manual labor. **m**



Marking It Up You can annotate a document electronically in MarkUp. The Marks palette provides standard proofreaders' marks, and the Tools palette lets you attach typed or recorded annotations, draw arrows and other shapes, and highlight text. The boxed numeral 1 indicates a note that opens with a double-click.



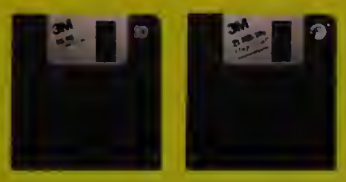
Power Searching with Nisus Nisus's PowerSearch+ feature makes short work of massaging downloaded text—once you learn how to use it. This string of codes tells Nisus to replace any single (but not double) carriage return with a space, thus wrapping the text without merging all the paragraphs into one.

WHERE TO BUY

DocuComp II 1.0.6 $179.95; Advanced Software; 408/733-0745.
MacWrite Pro 1.0v4 $249; Claris Corporation; 408/727-8227.
MarkUp 2.0 $195; Mainstay; 805/484-9400.
Microsoft Word 5.1 $495; Microsoft Corporation; 206/882-8080.
Nisus 3.4 $395; U.S. Legal, U.S. Medical, British Legal, British Medical dictionaries $30 each; Nisus Software; 619/481-1477.
Word Wrapper 5.1 $39.95; Open Designs; 415/929-0924.

Next Month: Cleaning Up Data for Your Database

Contributing editor JIM HEID has been writing about the Mac since its introduction. His most recent book, *Macworld Complete Mac Handbook+CD*, is published by IDG Books Worldwide.



More computer users prefer to keep their important data safe and sound on 3M diskettes than any other brand. That's because inside and out, each diskette is built for reliability and tested for 100% error-free performance. Just what you expect from the world's leading manufacturer of diskettes.

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Manage your money with the right accounting software

GROWING a Small Business

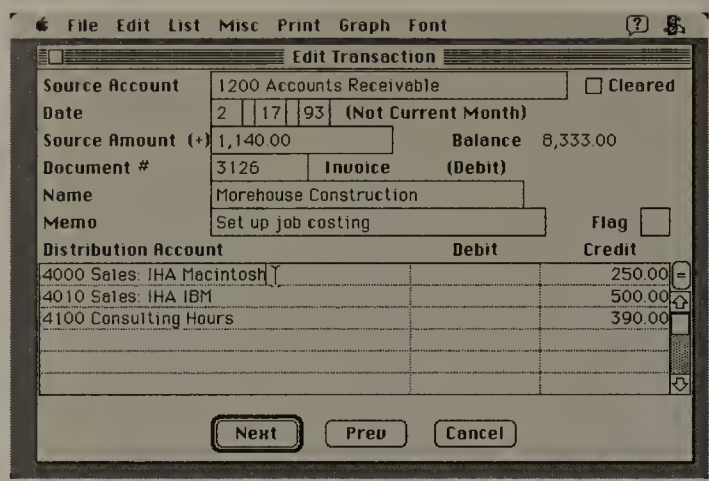
Nothing is as important for your small business as your accounting software. It is the key to knowing where your business is headed and to directing it where you want it to go—and to staying on good terms with the IRS.

All accounting programs offer some way of tracking income and expenses. Personal-finance/home-business packages offer tracking through a simple check-register interface (see the sidebar "Using Personal-Finance Software in Business"); full-blown accounting systems use journals—accounts payable, accounts receivable, and so on—to feed data into a general ledger summarizing your financial situation.

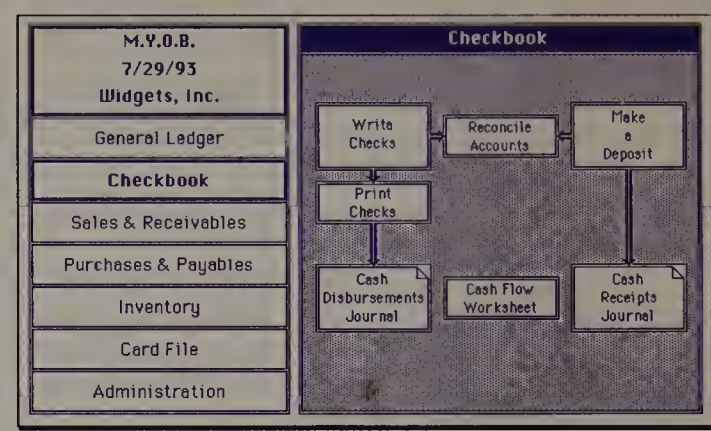
How do you decide which accounting package is right for your needs? If you stock items for resale, you should seek inventory-tracking ability. If you allow customers to pay later for your products or services, you need accounts receivable capability. To take advantage of credit terms offered by your suppliers, you need a way to track accounts payable. And if you have more than four or five employees, the ability to process payroll (and tax reports) should save you a lot of time.

BY ALAN SLAY

In this article I focus on seven mainstream small-business accounting packages. Teleware's M.Y.O.B. 3.0 provides inventory and a wide range of reports, but it lacks payroll. Teleware's BestBooks 1.0 is a simplified version of M.Y.O.B that lacks an inventory module, but it lets you leave your books temporarily out of balance. Peachtree Accounting for the Macintosh 2.0 (formerly AtOnce) and CheckMark's MultiLedger 3.0 adhere to strict accounting guidelines that ensure an adequate audit trail. Computer Associates' CA-Simply Accounting 1.3 provides payroll and inventory and, at $89 list, is a bargain. Business Sense 2.1, from Software Developers' Consortium, does recurring entries to automate routine tasks, common in personal-finance software but unusual in the business world. In-House Accountant 1.2 is an old-style ledger program, but it provides fund accounting, a technique used by nonprofits and government agencies that must manage preallocated funds from many sources. (Accountant Inc., which has won high marks in previous *Macworld* accounting overviews, was not on the market when this article was being written. For a look at its new incarnation, MacP&L, see "Coming Soon.") Many of the personal-finance products have all it takes to run a very



Ledger Book In-House Accountant provides an unchanging transaction window when entering sales, purchases, or any other type of transaction. This transaction shows a sale with revenues to be split over several accounts.



Accounting Flowchart M.Y.O.B.'s "command centers" bring all tasks related to a function into one place—in this case, all checking tasks—and provide a flowchart that shows users what order to perform them in.

small business; "Using Personal-Finance Software in Business" offers a quick rundown of those products.

All about the Interface

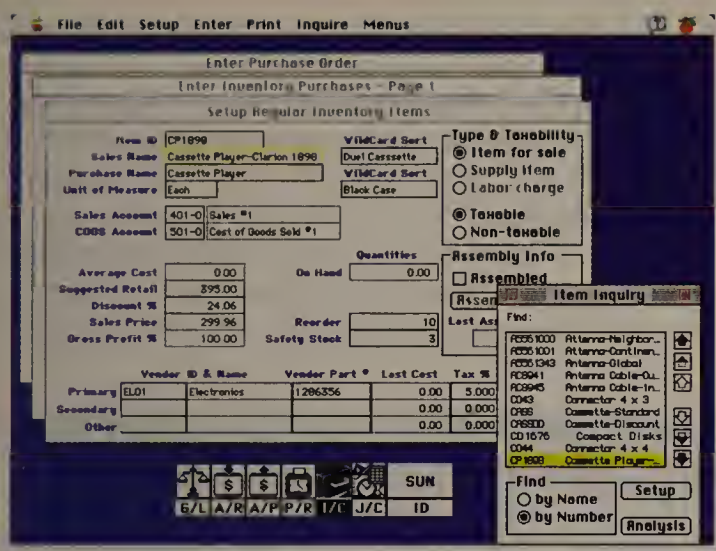
Mac developers know that providing accounting capability isn't enough: they also have to make their programs accessible with an intelligent interface.

In my view, the M.Y.O.B. (Mind Your Own Business) interface is the most functional and efficient of the lot. Each module uses a flowchart metaphor: you pick a task, and you get a flowchart showing all the functions involved in performing that task. The omnipresent to-do list tells you what you have to do and lets you jump to any part of the program to do it.

Small-Business Accounting Packages

	BestBooks 1.0	Business Sense 2.1 [A]	CA-Simply Accounting 1.3	In-House Accountant 1.2	MultiLedger 3.0 [A]	M.Y.O.B. 3.0
General						
Company	Teleware	Software Developers' Consortium	Computer Associates	In-House Software	CheckMark	Teleware
Phone	201/586-2200	801/288-1222	516/342-5224	408/649-0576	303/225-0522	201/586-2200
Toll-free phone	800/322-6962	○	800/225-5224	800/775-4567	800/444-9922	800/322-6962
List price	$99	$395	$89	$349	$395	$199
Money-back guarantee/demo version	●/○	●/○	●/●	○/● [B]	●/● [C]	●/●
Support	60 days free	30 days free	2 free calls	unlimited free support	unlimited free support	30 days free
Batches invoices for payment	●	●	○	●	●	○
Prints user-defined memos on checks	●	○	○	○	●	●
Internal payroll/inventory/job-tracking	○/○/●	●/○/●	●/●/●	○/●/○	● [D]/●/●	○ [E]/●/●
Integrated import/export	●/●	●/●	●/●	○/●	●/●	●/●
General Ledger						
Chart of accounts	●	●	●	●	●	●
Automatic reversals	●	●	●	○	●	●
Enter prior-period transaction	●	●	●	○	●	●
Budgeting	●	●	○	●	●	●
Accounts Receivable						
Calculates finance charges	●	●	●	○	●	●
Provides customer credit limits	●	●	○	●	●	●
Separate bill-to/ship-to addresses	●	●	●	●	●	●
Accounting method (cash/accrual)	○/●	●/●	○/●	●/●	●/●	○/●
Accounts Payable						
Allows entry of prior-dated invoices	●	●	○	●	●	●
Assigns document number	●	○	●	●	●	●
Calculates due date	●	●	○	●	●	●
Calculates discount	○	●	○	○	●	○

● = yes; ○ = no. [A] Multiuser version available. [B] Demo is $19.95. [C] Demo is free. [D] Imports from CheckMark Payroll ($295). [E] Imports from CheckMark Payroll ($295) and Aatrix Softwa
[F] Bundled with import/export utility.



Peachtree's Interface Pop-ups and radio buttons are used to set up inventory items in Peachtree Accounting for Macintosh. A reorder quantity can be entered to flag items that are running low, and several prices can be applied for discounts or sales.

Teleware's new $99 small-business package, BestBooks, retains the excellent M.Y.O.B. interface but is scaled down and easier to use. Gone are the general ledger and general journal modules, and the Administration window is simplified. And BestBooks has no inventory and cannot import from third-party payroll packages, as M.Y.O.B. can.

Peachtree Accounting for the Macintosh also has a strong interface, with extensive use of automatic pop-up windows for such tasks as entering inventory items, customer names, and vendor names into data entry forms. CA-Simply Accounting and Business Sense both display icons that open the journals with a click.

At the plain end of the interface spectrum lies MultiLedger. The program uses simple, well-organized menus, making navigation a pleasure. Once you're in a form, the program makes extensive use of pop-up windows to help you select account categories, customers, and vendors.

With a single form for entering all types of transactions, In-House Accountant's interface is the weakest of the bunch, especially for the novice. If you want to enter a vendor bill as a payable, you designate payables as your *source account*, and then enter the date, vendor, and document information. You then enter the amount at the bottom of the screen in a form that looks like a standard debit-credit ledger. Next you click on a button to post the entries. If you are experienced with conventional bookkeeping ledgers, you will feel comfortable with this program; otherwise, you could easily become confused.

Peachtree Acounting for Macintosh 2.0

Peachtree Software

404/564-5700
○
$169
●/●
30 days free
●
○
●/●/●
F/F
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Paycheck ($79).

Keeping It Confidential

If you're not the only person who touches your Mac, you probably want control over who has access to your accounting information. Beyond a simple password to lock unauthorized users out of the system, which all the programs offer in one way or another, some programs let you set up layered password schemes. For example, you might want your part-time bookkeeper to be able to post receivables but not see payroll, or you might give a salesperson access to inventory but not payables.

In M.Y.O.B. and BestBooks you can set up a different password for every command, report, and screen, whereas Peachtree, In-House Accountant, and CA-Simply Accounting allow you to control access to different areas—receivables, payables, and so on. MultiLedger can split access to let some people enter transactions and others see reports. Business Sense has a master password and a separate password for its payroll section.

On the Audit Trail

The flip side of controlling which employees have access to your company's information is keeping track of what they do—or figuring out what you did six months ago. Your accountant will probably quail at the thought of a bookkeeping system that lets users modify or erase transactions ex post facto, but some

COMING SOON

One package that we were unable to look at and the upgrades to two products that we examined will be shipping by the time you read this. Here is a brief rundown.

Quicken 4.0

- Provides loan planning.
- Recognizes what you type and completes fields for you.
- Shows underlying data when you double-click on a report or graph.
- Automatically creates budgets based on the previous year.
- Selects date ranges for reports when you type phrases such as "last quarter" or "year-to-date."

Business Sense 2.2

- Includes state tax tables for all states at no charge.
- Has a simplified menu structure.
- No longer requires relaunching the program to switch companies.
- Can import from the time-billing program Timeslips III.

MacP&L

State of the Art's MacP&L (formerly Accountant Inc.) offers inventory, payroll, and project tracking. MacP&L is geared to dedicated bookkeepers or others who feel comfortable with debit and credit columns.

- Has more than 100 reports and lets you set their time period.
- Has excellent new documentation.
- Can import the chart of accounts, customer and vendor lists, and inventory items from other accounting packages.

software vendors favor your convenience over rigorous adherence to accounting guidelines with products that don't require you to make a separate entry to modify or reverse a transaction.

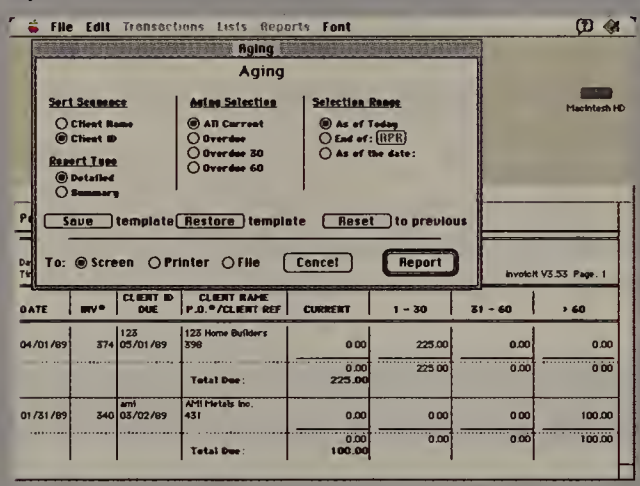
M.Y.O.B. gives you a choice, letting you set up the database as changeable or unchangeable—"unchangeable" forces you to create reversing entries. M.Y.O.B.'s little cousin, BestBooks, has no audit-trail features at all. Peachtree, Business Sense, and CA-Simply Accounting force you to create a reverse entry, while MultiLedger and In-House Accountant let you change anything—In-House even allows you to modify or delete transactions in closed periods.

Closing Periods

Whether or not you leave an audit trail as you work, sooner or later you will stop going back to rewrite the past. Some accounting packages make it more

USING PERSONAL-FINANCE SOFTWARE IN BUSINESS

If you're an entrepreneur making money on the side with a small business, consider using one of several personal-finance packages that are loaded with business-oriented features. M.USA Business Systems' CashBiz for the Mac 1.0, Aatrix Software's CheckWriter Pro 5.0, DacEasy's DacEasy Light Checkbook Accounting 2.0, MECA Software's Managing Your Money 5.0, and Intuit's Quicken 3.0 all offer business charts of accounts; budgeting; and the equivalent of a general ledger, accounts payable, and accounts receivable. Aatrix's Hi Finance 4.0 even offers inventory, and Survivor Software sells InvoicIt, an invoicing add-on to its MacMoney 3.5.3. Several personal-finance programs can import payroll data from Aatrix's Paycheck.



InvoicIt Aging Report Survivor Software's InvoicIt, which exchanges data with Survivor's MacMoney, can generate reports that show the status of accounts receivable.

MacMoney Its invoice-writing add-on, InvoicIt, and its ability to import from Aatrix's Paycheck give MacMoney an edge over the other packages as a business tool. MacMoney also imports from Prodigy's BillPay USA program (but it can't import the information as transactions and so requires manual intervention).

Aatrix's Hi Finance, CheckWriter Pro Hi Finance, with its strong inventory capability, and CheckWriter Pro have some unique features, including support for printing on the checks from your checkbook (you can also buy preprinted checks) and the ability to print bar codes on your checks so you can reconcile your account with a scanner—very useful if your business generates a lot of checks.

Managing Your Money MYM provides a good set of basic business reports, makes extensive use of pop-up windows for accessing names and charts of accounts categories, imports from Aatrix Paycheck, and works with the CheckFree electronic bill-paying service.

Quicken Quicken imports data from Aatrix Paycheck and generates reports by job, client, project, or department. It also works with CheckFree.

CashBiz for the Mac CashBiz provides invoicing and cash-based business accounting, but otherwise it has far fewer business features than its competitors, with no inventory and no payroll import.

DacEasy Light Checkbook Accounting Dac lacks integrated payroll, inventory, and job-tracking but is easy to use, generates invoices and statements, and has a business chart of accounts. The manual is heavily slanted toward the business user.

Business Features in Personal-Finance Packages

	CashBiz for the Mac 1.0	CheckWriter Pro 5.0	DacEasy Light Checkbook Accounting 2.0	Hi Finance 4.0	MacMoney 3.5.3	Managing Your Money 5.0	Quicken 3.0
Company	M.USA Business Systems	Aatrix Software	DacEasy	Aatrix Software	Survivor Software	MECA Software	Intuit
Phone	214/386-6100	701/746-6801	214/732-7500	701/746-6801	310/410-9527	203/256-5000	415/322-0573
List price	$49.95	$79	$69.95	$99	$119.95	$39.95	$69.95
Tracks assets, liability, income, expenses	●	●	●	●	●	●	●
Internal invoices	●	○	●	○	●[A]	○	○
Internal payroll	○	○[B]	○	○[B]	○[C]	○[C]	○[C]
Checking-account reconciliation	●	●	●	●	●	●	●
Tracks credit purchases	●	●	●	●	●	●	●
Reminders	○	●	○	●	○	●	○
Free unlimited support	●	●	60 days free	●	●	●	●

● = yes; ○ = no. [A] *InvoicIt add-on is $99.95.* [B] *Does not import Aatrix Paycheck.* [C] *Imports Aatrix Paycheck.*

trouble than others to set up and close periods—the point when you stop adjusting your books, summarize the period's results, and move your balances into the next period. Peachtree Accounting for Macintosh supports 12- or 13-period years (for companies that want perfect four-week "months"), and you can lock a period without closing it, useful to prevent entering a transaction in a period that remains open while you wait for your accountant to go over your books. Simply Accounting and Business Sense don't force you into any period structure. For example, if your business is only open between Memorial Day and Labor Day, you can treat that time span as a single period.

M.Y.O.B doesn't force you to close monthly or even at the end of the year, so you could continue to accumulate financial data for as long as you want. However, some critical reports, such as the profit-and-loss statement and the balance sheet, use data from all open periods, so if you don't keep your books in line with your fiscal calendar, M.Y.O.B. will give you meaningless reports that may drive your accountant to distraction.

Reports: Milestones for Your Business

Extracting meaningful information from your accounting database would be arduous if your software couldn't generate reports for you. Your reporting needs may be simple—a balance sheet showing the state of your accounts, a profit-and-loss statement, journal statements. But as you learn more about your business, you'll want more reporting capabilities, and your loan officer and accountant will probably have questions that a good set of reports can answer. M.Y.O.B. has about 70 reports, and BestBooks only a few less; Peachtree has more than 50. Beyond the sheer number of reports, M.Y.O.B. and Peachtree provide a lot of flexibility in choosing what dates and which accounts are summarized in reports, and Peachtree lets you modify your reports' layout and even their contents.

If You Bid on Contracts

If you bid on contracts, you might want a way to create an invoice to submit as a bid without its being posted to the database. M.Y.O.B. does this by putting invoices in a pending file, a holding tank from which you can delete the invoices or post them. None of the other programs support an equivalent feature, but it would be easy to fudge it in the programs that let you delete transactions.

Making Payroll

Payroll for one or two people is easy enough to do by hand, but when your company approaches a half-dozen employees, you need either a payroll module in your accounting program or a separate payroll program that can feed payroll information into your accounting program.

CheckMark Payroll is a stand-alone program that is more flexible than the payroll modules of most complete systems, many of which can import Payroll's data. Payroll lets you enter work schedules for all employees for each pay period on one screen; other programs make you go to each employee's record, a pain if employees' schedules change.

M.Y.O.B. has no payroll feature, but it can import from CheckMark Software's Payroll or from Aatrix Software's Paycheck. In-House Accountant also has no payroll feature, nor does it import from external payroll add-ons. CheckMark's MultiLedger imports Payroll data easily.

Peachtree Accounting and CA-Simply Accounting have internal payroll features, which saves you having to import payroll data, although they require that you go from record to record to enter schedules, deductions, and so on.

Business Sense has been criticized in the past for its payroll capability, which required that you enter tax tables by hand, but the program's publisher says the soon-to-appear upgrade will eliminate that onerous task (see "Coming Soon").

Documentation and Support

M.Y.O.B.'s documentation gets high marks for readability and use of illustrations—it is a notch above the others. Peachtree's manual is also good, and CA-Simply Accounting offers a very good manual plus a short primer on bookkeeping. The MultiLedger manual is not lavish, but it is more than adequate.

Business Sense and In-House Accountant have changed hands repeatedly in recent years. Documentation for Business Sense is adequate and has been updated, but In-House Accountant's documentation still refers to the original publisher, and considering the complexity of its single-form approach, its manual is barely adequate (In-House Software says it is revising the manuals).

CheckMark offers free, unlimited support; all of the other publishers offer a short period of free support, after which you can purchase a support contract.

Choosing Your Bookkeeper

Which accounting package is best for you? As you can see, there is a wide range of good choices. To choose, look at the table "Small-Business Accounting Packages," which summarizes the features and functions each program provides. Then talk it over with your accountant; your accounting software must be acceptable to both of you. Your accountant may be satisfied with getting year-end data in a text file, or he or she may want you both using the same program so you can hand over your program's complete data files.

Then, look for a money-back guarantee or a demo version and try setting up a chart of accounts for your business, entering some transactions, and running some reports. It pays to choose carefully: starting over with a new program can be a time-consuming and troublesome chore. m

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ALAN SLAY has been covering accounting for *Macworld* since 1988.

SMALL-BUSINESS ACCOUNTING

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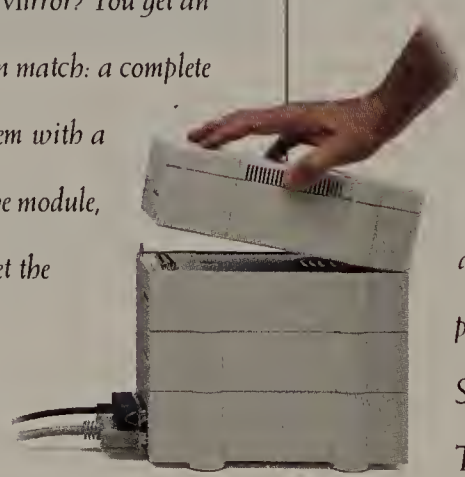

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Circle 100 on reader service card

BY LON POOLE

Quick Tips

Tips, Tricks, and Shortcuts

YOU CAN HORIZONTALLY CENTER THE text area in a WordPerfect 2.1 document window by clicking the window's zoom box, expanding the window to the full size of the screen (see *Quick Tips*, June 1993). Moreover, clicking the zoom box on a small-screen Mac makes the window wide enough to show the text area's full width for an 8½-by-11-inch page with 1-inch margins. After you resize or move a document window, WordPerfect remembers that size and location the next time you open the document, unless, as Dan Rosner of New York points out, you turn off the Remember Window Location option of WordPerfect's Preferences command.

If you don't want to bother resizing windows of new WordPerfect documents, and you have version 2.1.2 or later, try the workaround suggested by John A. Walsh of Bloomington, Indiana. You create a new document, click its zoom box, and save it as a stationery document with the name New Document Stationery in WordPerfect's Stationery folder (inside the WordPerfect folder). Thereafter, documents you create with WordPerfect's New command have the same initial window size and location as New Document Stationery. Prior to saving New Document Stationery, you can also set the initial character, paragraph, and document formatting that you want all new documents to have. Earlier versions can create stationery documents but do not automatically use the settings in the document named New Document Stationery; an upgrade to version 2.1.4 costs $16 (contact Information Services at 800/451-5151).

Correct Keyboard Restart

If your IIsi, LC, LC II, LC III, Classic II, Duo 210, or Duo 230 crashes and the mouse stops working, you can restart the computer by pressing ⌘-control–power on. (Joe Holmes of Brooklyn noticed that July's *Quick Tips* listed the wrong key combination.) The restart key combination has the same effect as the restart button located on the front, side, or back of other Mac models. Use these methods only in an emergency, because they don't close files or disk directories properly, making the Mac take extra time during restart to verify directories. The Restart button in a bomb alert box doesn't always work, but when it does work it closes directories properly. The Finder's Restart command is the most secure restart method because it quits each open program in an orderly fashion, asking if you want to save changed files as needed.

Temporary Mystery

Q. While using Microsoft Word 5.0, I created a new folder named Temporary Items and saved some files in it. Much to my surprise the folder was gone after I quit Microsoft Word. I searched for the folder and the files with the Finder's Find command, but they had disappeared. Because Word lists the most recently closed four files in its File menu, I was able to open the missing files, but I don't know where the folder went. After restarting my Macintosh, I found the missing files in the Trash in a folder named Rescued Items From Macintosh HD. What happened?

D. D. Tarn
St. Louis, Missouri

A. You have discovered a minor flaw in System 7, one that affects not only Word but Excel and all programs with a New Folder button in their Save and Save As dialog boxes. (The New Folder button is a standard part of the System 7 interface, although many programs suppress it.) Finder 7 doesn't let you name anything Temporary Items, and neither should the New Folder button allow that name. Here's why: System 7 reserves the name Temporary Items for a folder it creates as needed on each disk to hold scratch files that programs use temporarily. The system makes the folder invisible so it doesn't appear in the Finder, though invisible items may appear in directory dialog boxes you get with Open, Save, and other disk-related commands. The Finder's Find command ignores invisible items and their contents; Word's Find File command includes them in its search. My tests indicate that a Temporary Items folder you create becomes invisible only if you put the folder at the root level of the start-up disk or the disk containing the program with which you created the folder.

If System 7 finds files in a Temporary Items folder during start-up, it assumes some program left them there when the program quit unexpectedly or when the system crashed. Had all programs quit normally prior to start-up, they would have automatically deleted their temporary items. System 7 does not expect you to save items in a Temporary Items folder.

continues

ALTERNATING OVERLAPPED COLORS

Ordinarily, in Aldus FreeHand 3.1, composite paths (such as text converted to paths) have the same fill and line colors. Here's how Ernest Wang of Singapore alternates the colors of composite paths that overlap.

1. With the text tool, enter the text you want to color (for example, the word *Love*). Choose Convert To Paths from the Type menu, and use the Colors palette to set the fill to a color (blue here) and the line to none.

2. Choose Split Elements from the Element menu to make each letter an individual element. Rearrange the letters—resizing, rotating, and overlapping—to get the look you want. Then choose Select All from the Edit menu followed by Join Elements from the Element menu.

3. Use the Arrow tool to option-click the first letter, and then clone it (by choosing Clone from the Edit menu). Set the fill of the clone to the color you want for the overlapping regions (yellow here) and choose Send To Back from the Element menu. Repeat this step for each odd-numbered letter. (If you clone a letter with a closed region, such as *O*, the closed region will be filled in. Fix this by option-clicking the closed region of the clone, cloning that, and setting the clone's fill to the background color.)

4. Again use the Arrow tool to option-click the second letter, clone it, and set its color (red here). Choose Cut from the Edit menu to remove the clone to the Clipboard; option-click the letter that appears where the clone was; and choose Paste Inside from the Edit menu. You have now colored the nonoverlapped area of the second letter. Repeat this step for each even-numbered letter. (For even-numbered letters, you don't have to do anything to fix filled-in closed regions, because the Paste Inside command takes care of them.)

During start-up System 7 rescues all items it finds in a Temporary Items folder by moving the items to another folder (whose name begins Rescued Items From) in the Trash. The theory is that you may be able to recover work in progress by opening rescued temporary files, though this seldom pans out.

Broken Icons

Q. I have managed to delete the invisible Icon files that contained the custom icons for disk drives and folders of mine. After doing this to a disk or folder, I can no longer cut, clear, or paste the icon in the Get Info window of the file or folder. When I try, the Mac gives the informative message "The command could not be completed because it cannot be found." I can work around a broken folder (by moving the contents of the broken folder to a new folder and discarding the broken folder), but I have not found any way around this problem for disk drive icons other than reformatting. Things that don't remedy this problem include rebuilding the Desktop file, making a new invisible icon file and hoping the icon resource ID matches, starting up from another disk, pleading, and so on. Any ideas?

John Stroud
via America Online

A. Congratulations; it's not easy to delete an invisible file. You can fix your broken icons with the Shareware utility Custom Killer by Robert Gibson (available from user groups such as BMUG, 510/549-2684 or 800/776-2684, and from online information services such as America Online). This utility is designed to remove custom icons from files, folders, and disks, and it also fixes screwed-up folder and disk icons like yours. You'll get quicker removal of custom icons by dragging an item or multiple items to the Custom Killer icon than by using the Finder's Get Info command.

Waterproof Ink-jet

TIP On my last trip to my favorite business store, I was delighted to find that Avery labels can now be printed on a Hewlett-Packard DeskWriter. However, from past unhappy experience, I know that the water-soluble ink blurs when wet. I waterproof the ink by lightly spraying the completed label sheet with clear acrylic spray enamel, which is available in hardware and general stores at very low cost.

Lois Mirkin
Kansas City, Missouri

This tip also waterproofs the ink of Apple StyleWriters and other ink-jet printers.—L.P.

Emergency Disk

TIP Programs such as MacTools and Norton Utilities for Macintosh include a floppy disk for starting up your Mac and resolving hard drive problems. This emergency disk may not work with your Macintosh model because the disk has an earlier version of system software than your model requires. Although the disk-repair software won't fit on the smallest conventional System 7 start-up floppy, you can still create your own emergency disk.

Start with a newly erased (initialized) high-density floppy disk. Copy onto this empty disk the System file from the Disk Tools disk that came with your Mac. If your Mac model requires a System Enabler, copy the appropriate one from the same place. (The IIvx and IIvi use System Enabler 101, the PowerBook 160 and 180 use 111, the Duo 210 and 230 use 201, the Centris and Quadra models use 040, the Color Classic uses 401, the LC III uses 003, and the PowerBook 165c uses 121. Models older than these do not require enablers.) Also copy your disk-repair program (for example, Norton Utilities for Macintosh or MacTools' DiskFix) onto the new emergency disk. Now change the program's name to Finder.

The Mac recognizes this emergency disk as a start-up disk because it contains both a System file and a so-called Finder. When you start up with this emergency disk, the Mac automatically opens the disk-repair program as it normally would the Finder. Upon quitting the disk-repair program, the Mac restarts from the system on the hard drive. At least this is what happens on my LC III.

Joseph Bookmeyer
Yonkers, New York

continues

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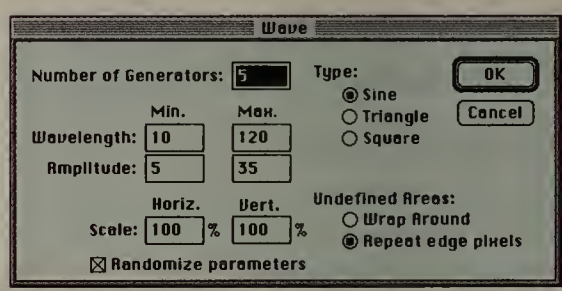
If you have System 7 installation disks, you can use them to install a minimum system for your Macintosh model. Start the Installer, but don't click the Easy Install button. Instead click Customize, select the minimum system option for your Macintosh model from the scrollable list, insert the newly erased floppy, and click Install. After installation, open the System Folder on the new emergency disk and drag the System file and System Enabler file (if any) to the disk icon. Then drag the System Folder to the Trash and empty the Trash. At this point you should be left with a disk containing only a System file and a System Enabler file (if your model requires one).

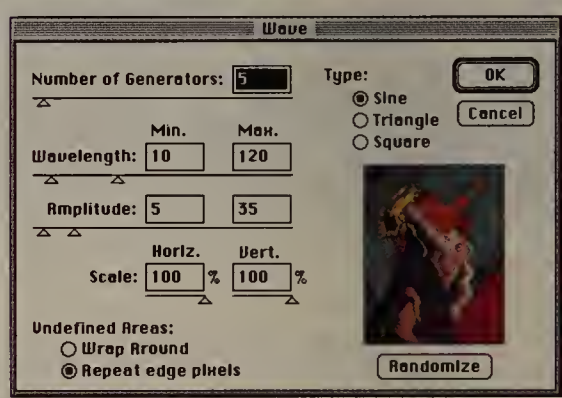
Other readers have submitted different methods for creating an emergency disk. This is the method that seemed simpler than the others: changing not only the name but also the type and creator of the disk-repair program on the emergency disk; changing the name of the start-up application as specified in the emergency disk's boot blocks from Finder to the name of the repair program; and creating a RAM disk large enough for a conventional System Folder and the disk-repair program.—L.P.

Optional Filter Controls

TIP In Photoshop 2.5, choosing a plug-in from the About Plug-ins submenu of the Apple menu normally brings up a dialog box describing the plug-in you chose. If you choose one of the nine distortion filters written by John Knoll, such as Pinch, and press the option key until the descriptive dialog box appears, it includes a heretofore hidden check box labeled "Show previews & sliders." Checking that check box adds

continues





Sliders and Preview Turning on a hidden option expands the standard dialog boxes you get for seven of Photoshop 2.5's distortion filters, such as Wave (top), to include slider controls and a preview image (bottom). To access the hidden option, press option while choosing the distortion filter by name from the About Plug-in submenu of the Apple menu.

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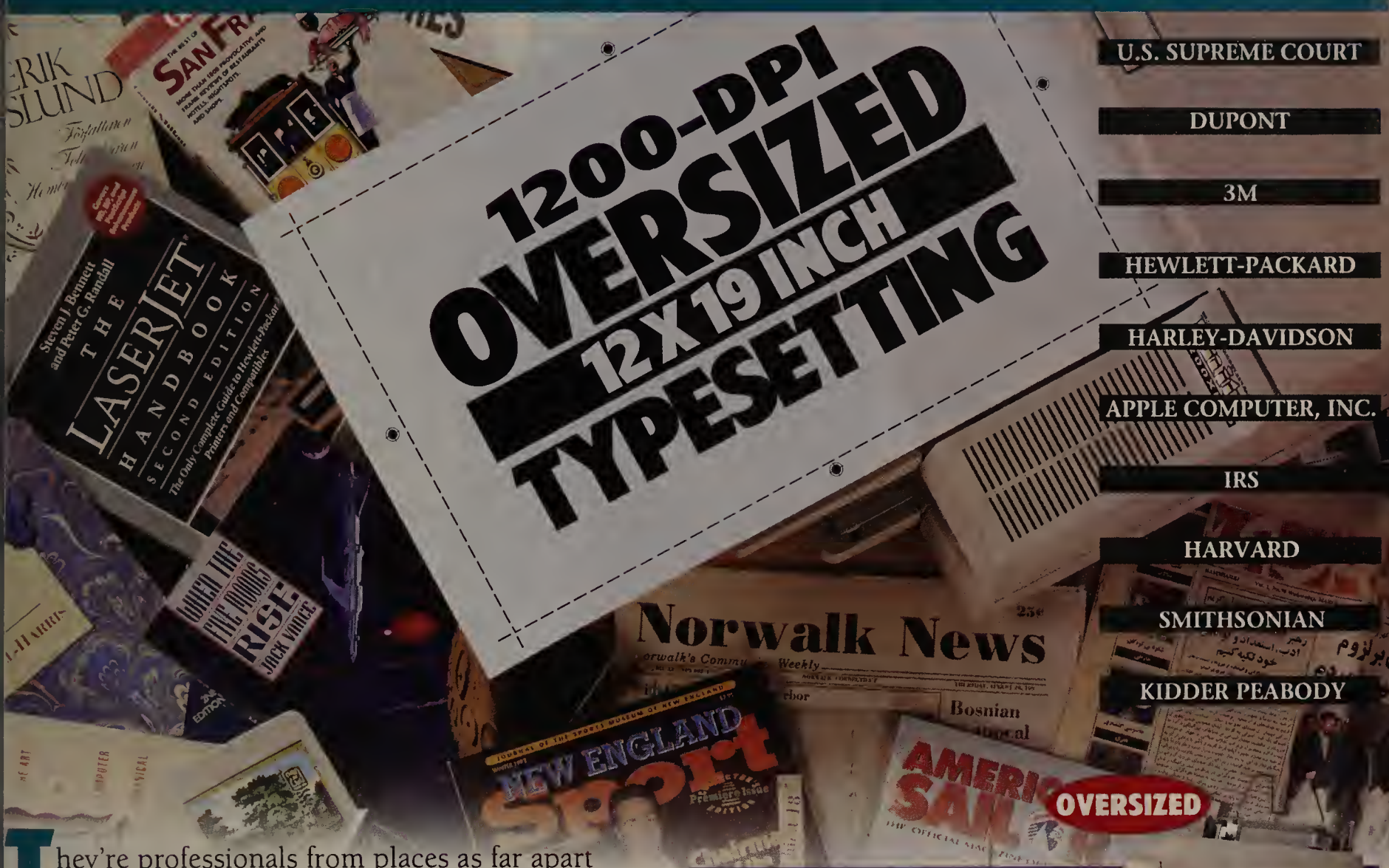

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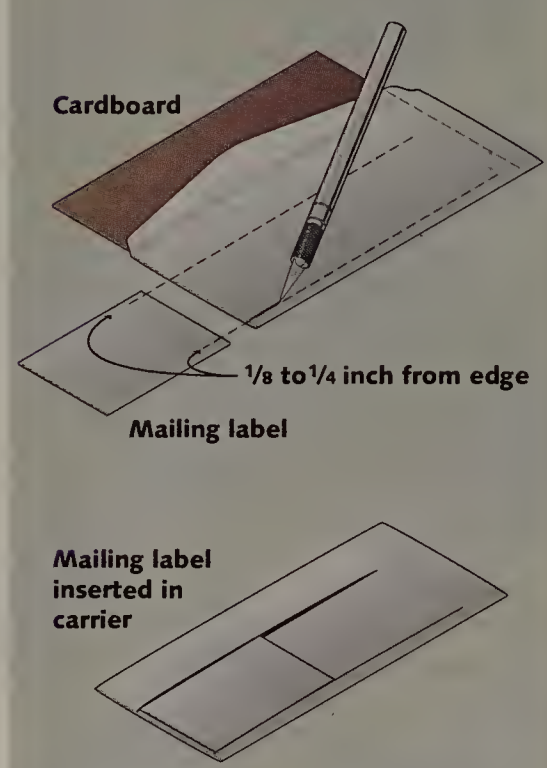
Chris Tillman of Tucson, Arizona, has found an easy way to print postcards, odd-size notes, individual 4-by-3-inch mailing labels, and small envelopes on a printer that is not designed to work with anything smaller than a number 10 envelope.

Let's say you're printing mailing labels. Align a label with a number 10 envelope that's face up. Mark two lines on the envelope: one that's 1/8 to 1/4 inch from the bottom of the envelope and another that's 1/8 to 1/4 inch below the top of the label. Place a piece of cardboard inside the envelope to protect the underside. With a razor or X-acto knife, cut two slits along the marked lines (as shown). Then remove the cardboard protector from the envelope and seal the flap. Now you've got a custom paper carrier.

To print the label, simply tuck its top and bottom edges into the carrier's top and bottom slits, pushing the label all the way to the bottom of the carrier. A carrier can last through 100 print cycles or more.



slider controls and a preview image to the dialog boxes of seven of the distortion filters—Pinch, Polar Coordinates, Ripple, Spherize, Twirl, Wave, and Zigzag (see "Sliders and Preview"). These additions make the filters much easier to use. Just for fun, try choosing About Photoshop 2.5 from the Apple menu first while pressing option and then while pressing ⌘.

A. Trevor Barrett
via America Online

Cord Tamers

TIP You can tidy up all those cords snaking out of the back of your Macintosh with an inexpensive shower-curtain-rod cover from a hardware store or home decorating store. These simple plastic tubes are slit up the side so you don't have to thread cords through them. Each tube holds several cords and can be trimmed to any length. The covers come in decorator colors to match your office or your mood. I paid just a buck and a half for mine.

Neil Parker
Summerland, British Columbia, Canada

Multiple Deletes

TIP To delete several objects (graphics or text) in PageMaker, try holding down the delete key while clicking the objects one after the other. You can also delete several groups of objects by holding down delete while dragging a selection rectangle around one group, then another selection rectangle around another group, and so on. This method has a different feel than the usual method (shift-click and shift-drag to make a group selection, and then press delete once).

Luc Desaulniers
Montreal, Quebec, Canada

Tool-Bar Tricks

TIP The tools on Excel 4.0's tool bars have documented primary functions, and some have undocumented secondary functions. Clicking the AutoSum tool on the standard tool bar creates a sum formula, whereas pressing shift while double-clicking it creates an array sum formula. The Camera tool on the utility tool bar pastes a linked opaque picture of a selection to a new location, but press shift and the pasted picture is transparent. Clicking the Shadow tool on the drawing tool bar adds a drop shadow around the selected cells; clicking the same tool again removes the shadow but leaves an outline border. You use the Record Macro tool on the macro tool bar to record a new macro. Pressing shift when turning on the macro recorder appends the recording to the last macro.

Shane Devenshire
Walnut Creek, California

We pay from $25 to $100 for tips published here. Send questions or tips on how to use Mac computers, peripherals, or software (by mail or electronically) to *Quick Tips*, Lon Poole, at the address listed in *How to Contact Macworld* at the front of the magazine (include your address and phone number). All published submissions become the property of *Macworld*. Due to the high volume of mail received, we're unable to provide personal responses. m

LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld Guide to System 7.1* (IDG Books Worldwide, 1992).

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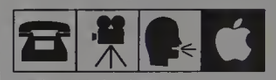

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EDITED BY ELIZABETH DOUGHERTY

Networks

THE LATEST IN CONNECTIVITY AND COMMUNICATION

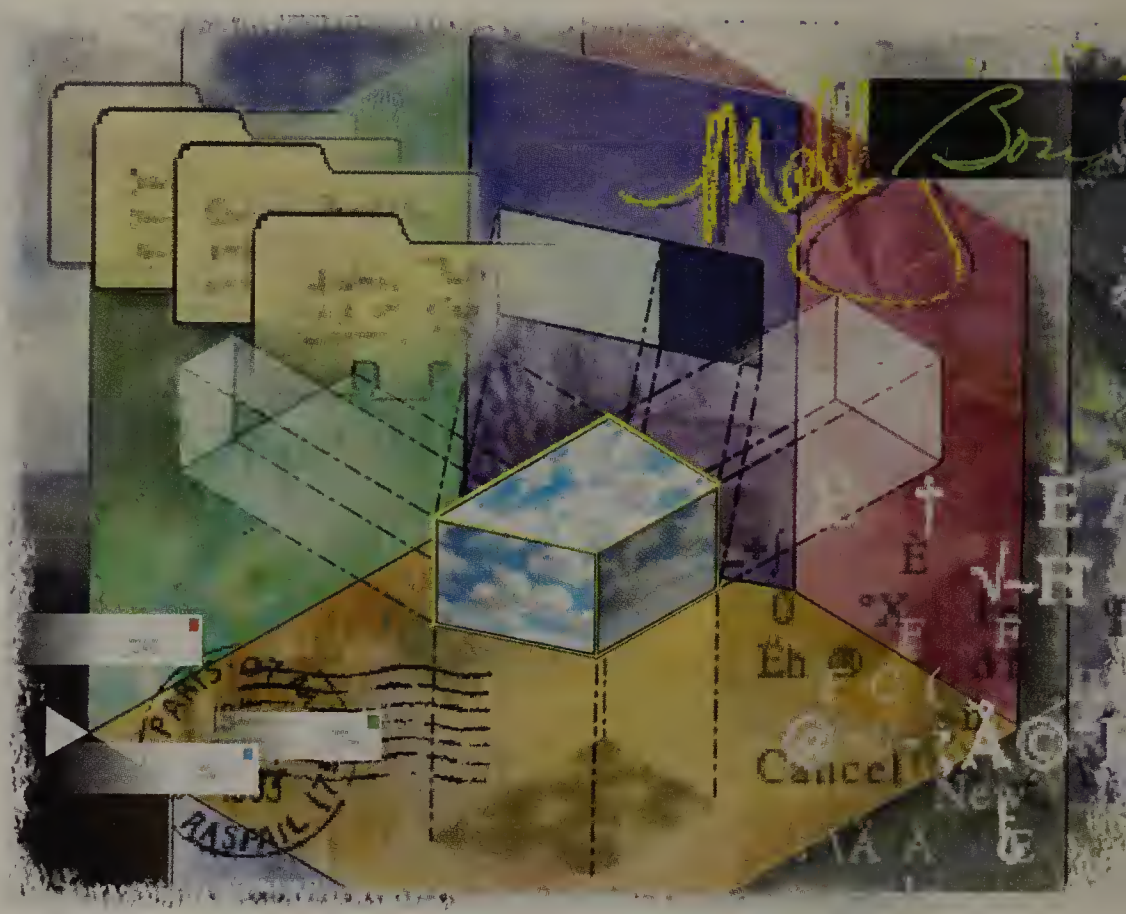
Open Season on Collaboration

THE APPLE OPEN COLLABORATION environment (AOCE) is finally emerging, along with a flock of applications ready to claim savviness to its services that can turn a static, one-user application into groupware. However, just as with System 7 or Apple events, all AOCE-savvy applications are not created equal.

The AOCE software, part of System 7 Pro ($149 for one user, $999 for ten users), is a set of system extensions that add peer-to-peer E-mail and a new kind of directory services (see "AOCE—Apple's Plan for Groupware" in this issue). The software also supports two services for creating work-flow applications: digital signatures and—if your network server has Apple's PowerShare server software ($999)—encryption.

Most AOCE-compatible applications support only its E-mail and directory services. But that's no small advantage: under AOCE, mailing documents from one user to another becomes an integrated Finder function, much as printing is now. Forthcoming applications such as WordPerfect 3.0, ClarisWorks, Helios USA's NetOctopus 1.2, and Cypress PhonePro 1.2 will let you mail any kind of document (text, fax, graphics, voice) by selecting a Send command from within the application. Users can also send files through AOCE's mail system using Apple's companion AppleMail software. CE Software's QuickMail for AOCE will offer a feature-rich alternative to the simple AppleMail.

Some programs on the horizon are going beyond E-mail to exploit AOCE in innovative ways. Beyond Software's PowerRules will let users script mail agents to filter, forward, store, and log any incoming message. Shana Corporation's Informed Foundation 1.4 will let users sign and exchange forms electronically. Articulate Systems is working



on software that will let its PowerSecretary voice-recognition system read AOCE messages to touch-tone callers.

Another group of developers is working on cross-platform message-sharing technology: Banyan, Star Nine, AT&T, CompuServe, STF Technologies, and others are creating Service Access Modules (SAMs), software modules that act as gateways between AOCE services and their counterparts on other systems. Banyan plans a SAM to let AOCE users access StreetTalk directory services; Star Nine's SAMs let AOCE users send and receive Microsoft Mail and QuickMail. AT&T and CompuServe are linking their online mail to AOCE. And STF's Faxstf 3.0 Pro will include a SAM that lets users send and receive faxes.

Look for the programs toward the end of 1993, after Apple releases System 7 Pro, which includes AOCE. Artic
late Systems, 617/935-5656; AT&T
201/ 606-2000; Banyan, 508/898-100
Beyond Software, 617/621-0095; C
Software, 515/224-1995; Claris, 408/72
8227; CompuServe, 614/457-860
Helios, 408/864-0690; Shana, 403/46
2220; Star Nine, 510/649-4949; ST
Technologies, 816/463-2021; Word
Perfect, 801/222-4620.—MARGIE WYLIE

Easy as SNMP

NETWORK MANAGERS CAN SURVE
the extent of their entire TCP/I
domain from MultiGate Manager 5.0, ne
Mac software now shipping from Netwo
Resources Corporation (408/263-8100

Based on the Simple Network Mar

MultiGate Manager lets you view the big picture of an Ethernet enterprise network.

agement Protocol (SNMP)—the nonpartisan standard for managing network devices—the $2295 application lets you gather information about any device connected to a TCP/IP network. MultiGate Manager harbors an SNMP agent and a management-information base (MIB). Depending on the device's agent, you may also be able to control some functions of the device, such as resetting a malfunctioning port on a router.

The software can warn managers of network problems through alarms, including paging. It also logs network events for export and analysis in Excel. MultiGate works with Apple's new Mac SNMP agent, allowing you to gather detailed information about the Macs on your network.

MultiGate Manager 5.0 doesn't work over AppleTalk; it can only manage Macintoshes or other devices connected via TCP/IP.—MARGIE WYLIE

Speed, Capacity, Security

BRING STORAGE, SPEED, AND FAULT tolerance to your Apple Workgroup Server 95, with a new line of disk arrays.

FWB's new SledgeHammer A/UX line works with A/UX 3.01 and AppleShare Pro, the software that ships on the server, so you can attach up to 28 disks—or about 80 gigabytes of storage.

Using Redundant Arrays of Inexpensive Disks (RAID) Level 1 technology, administrators can choose whether to stripe data across disks or to mirror data on two disks—or to use a combination of both. Striping data, which breaks up a file and simultaneously writes parts of it to more than one disk, works very fast, but it's not as safe as the mirroring method. Mirroring ensures that there's always a backup should one disk fail; if that happens, FWB's software instructs the server to read from the other disk.

FWB offers several two-disk arrays, ranging from 1GB ($3264) to 5.6GB ($11,825). Hard Disk ToolKit Pro A/UX software, which can transform a SCSI chain of hard disks you already own into a RAID array, can be purchased separately for $995. FWB, 415/474-8055.
—MARGIE WYLIE

Ethernet Speed, LocalTalk Ease

YOU CAN SNAP AN ETHERNET NETwork together like Tinkertoys with a new line of 10BaseT products from Farallon (510/814-5100). The Etherwave cabling system lets you put together an Ethernet network in what looks like a daisy chain, using phone cabling and a small, triangular three-port repeater.

There's no need to fuss with termination before moving or adding a device, nor to check for Ethernet address conflicts before attaching one. So roving users can join and leave the network at will without affecting its operation.

Like Farallon's PhoneNet line of LocalTalk products, Etherwave uses an RJ-45 modular phone connector in its Ethernet transceiver to make attaching devices to the network simple. Cards that connect directly via the Etherwave RJ-45 transceiver are available for Macs and DOS PCs. For Macs, PCs, or printers that already have Ethernet, an Etherwave converter is available. And Etherwave offers a connector that attaches through the serial port of any Mac. So Macs without a free internal slot can use Etherwave.

Planned for September release, Etherwave products should range from less than $150 to $400; prices were not final at press time.—MARGIE WYLIE

RICHARD RETHEMEYER

Farallon's Etherwave three-port repeater connects nodes easily with modular phone cable.

IN BRIEF

■ **Centralized Virus Scans** Your NetWare server can protect Macs from viruses with Central Point Anti-Virus for NetWare 1.1 ($1199). The NetWare Loadable Module software can automatically scour Mac and DOS or Windows PC desktops, as well as the server, for viruses. Central Point Software, 503/690-8088.

■ **Cross-Platform NetMan** Manage your Intel-based PCs and Macs from the same application with NetOctopus 1.2. The Mac software, which should be available in October, includes both Mac and PC agents and will list for about $100 per node. It also supports AppleScript and AOCE's mailer. Helios USA, 408/864-0690.

■ **Traffic Report** Farallon's $495 network-traffic monitor, Traffic Watch II, is now available from Neon Software, which has also taken over support and development. 510/283-9771.

A Meeting of the Mails

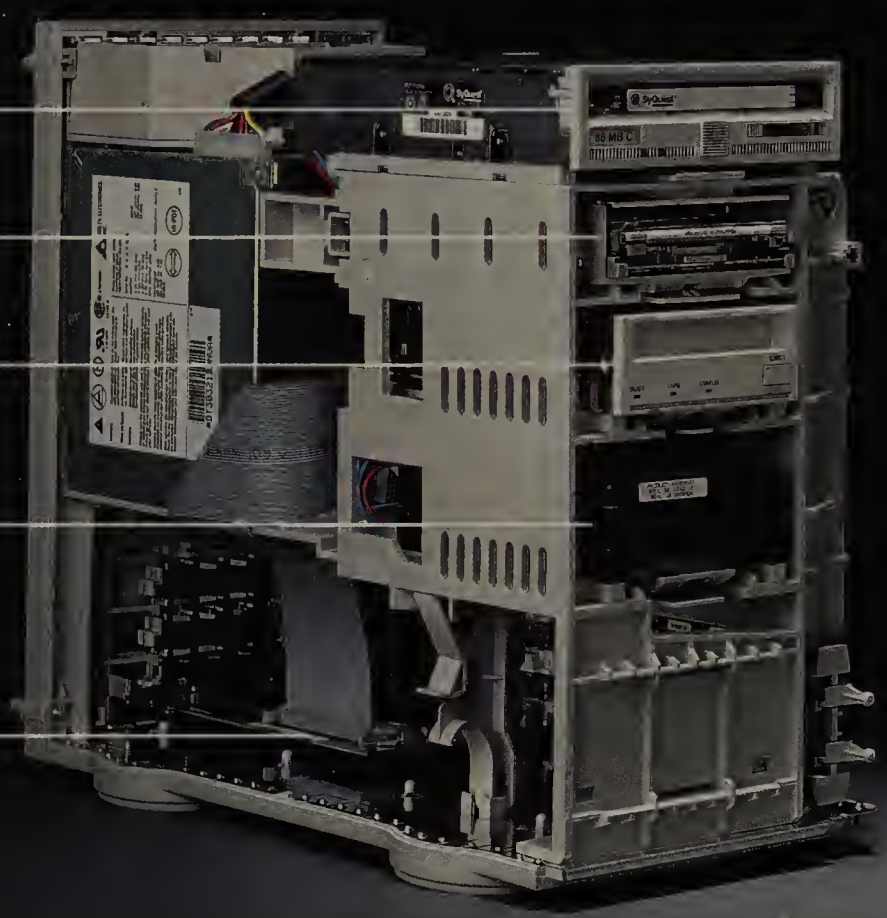
MACINTOSH USERS ON NETWARE networks can now share one E-mail server with their DOS PC counterparts through the QuickMail interface.

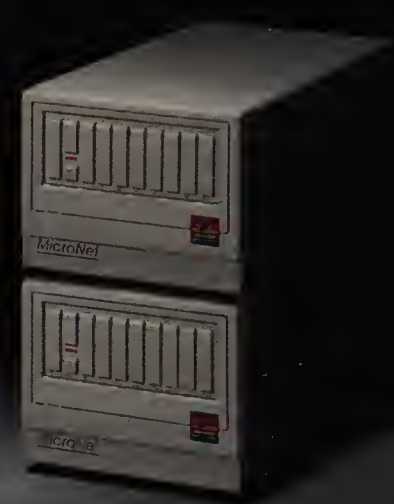
CE Software's QuickMail MHS lets Macs on a NetWare v3.11 LAN log on to NetWare Message Handling Service (MHS) E-mail servers. That not only allows Macintosh users to swap E-mail with most other NetWare clients, but also brings the advantages of MHS to QuickMail. For example, you can attach up to 62 files to one message, post messages to an MHS public bulletin board, and file messages and forms on the server. But, since MHS doesn't support mail logs, QuickMail MHS users can't keep one. Administrators can set and modify directory privileges and monitor mail usage from a DOS machine using the included QuickMail MHS Account Manager.

CE Software is also selling a Windows-based MHS client under the name QuickMail MHS for Windows. Both Mac and Windows MHS clients cost $599 for ten users. CE Software, 515/224-1995.
—MARGIE WYLIE

Disk Array Power!

NOW AVAILABLE
Easy to Install Raven Upgrade Kits For Existing Apple 500 or 1000 MB Disk Drives





MicroNet's Raven·800. Disk Array Power For The Quadra 800/840av.

MicroNet is the first to bring disk array power to the Quadra 800/840av. Using a pair of fast spindle disk drives, the Raven·800 transfers up to 6.2 MB/sec of sustained data with average access as fast as 4 ms.

Disk arrays can improve performance up to 400 percent over standard drives. Combine MicroNet's Raven·800 disk array with the speed of the Quadra 800/840av and you have an unbeatable system for audio recording, full rate digital video, and graphics applications such as PhotoShop.

Cost effective two drive disk arrays are available in capacities of 1030 to 5560 MBytes and are expandable to more than 38 GBytes. MicroNet offers Raven upgrade kits for existing MicroNet or factory installed Apple 500 or 1000 MByte drives.

Performance Quality AWARD OF EXCELLENCE Support Commitment

Built on award winning technology, the Raven·800 takes full advantage of Apple's existing hardware. One drive connects to the native SCSI port of the Quadra, and one connects to a MicroNet NuPORT-III, SCSI-2 host adapter. Together, these two drives create a fast, parallel, 16-Bit data path.

MicroNet offers a family of internal data storage systems for the Quadra 800/840av. Included are SyQuest removable systems, rewritable optical drives, and DAT backup systems. We back you with our 24-hour tech support and Over-Night-Exchange service.

To put high performance disk array power in your Quadra 800/840av, call our Sales Department today for the name of your nearest Reseller. 1-714-453-6100. Ask for a free copy of our Quadra 800 Configuration Guide.

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Circle 139 on reader service card

AOCE

If you could choose the perfect working world, it would probably be the one in the science fiction television series "Star Trek: The Next Generation."

Communicating and getting the job done on board the good ship *Enterprise* seems effortless. You never see Captain Picard signing paper reports; every document is electronic. You never see Worf checking multiple E-mail accounts, pagers, or faxes, although you know he sends messages in myriad ways. And you never hear Counselor Troi tell the computer an address more detailed than the name of the person with whom she wishes to communicate.

APPLE'S PLAN FOR GROUPWARE

If we can create this kind of system for a TV show, why can't we produce it in real life? What are we waiting for? Apple's answer is AOCE, the Apple Open Collaboration Environment.

AOCE technology adds to the Macintosh Operating System a set of services designed to turn today's mute, standalone applications into programs that can communicate, exchange information, and perform routine tasks for you—much as the smooth-talking *Enterprise* computer makes the connection between Star Fleet officers and their data.

Apple hopes AOCE will spur the development of new types of groupware (collaborative programs). A collaborative application could, for example, let several engineers hundreds of miles apart view, annotate, and approve a drawing in an electronic meeting. Apple also thinks

BY KEE NETHERY

AOCE's services will inspire the creation of custom groupware applications, such as the application discussed in "Workflow Automation: One Use for AOCE" (also see "Open Season on Collaboration," in this issue's *Networks* news).

While the ambitious charter of AOCE may seem futuristic and abstract, the first two products to bring AOCE to the Mac, System 7 Pro and the PowerShare Collaboration Server, offer some concrete advantages right away.

SYSTEM 7 PRO'S POWERTALK BRINGS AOCE TO THE MAC

The System and the Server

System 7 Pro (one user $149; ten users $999) comes with AppleScript and other system improvements that have been released since Apple's last major upgrade (see this issue's *MacBulletin*), but the star of the new system software is PowerTalk, the AOCE system extensions. PowerTalk implants four new services into the Macintosh Operating System: messaging (E-mail, the heart of AOCE), directory services, encryption, and digital signatures. Just as with System 7's file sharing, you can use PowerTalk without a PowerShare Collaboration Server ($999) in a peer-to-peer network.

The only time you need a PowerShare Collaboration Server is when you want the reliable delivery of an E-mail server that's always up, the control a master directory gives, or to use AOCE's over-the-wire encryption services. (PowerShare software can run on the same Mac as AppleShare file-server software.)

Messaging Services

PowerTalk can be your universal interface for sending and receiving messages. With PowerTalk, your desktop holds one mailbox, the In Tray. All AOCE-compliant applications share the In Tray, rather than using separate message containers for every messaging system (like QuickMail, AppleLink, or fax).

Having just one In Tray has several advantages. There's only one place to look for new messages; all messages can be filed away like files on your hard drive; and best of all, you can have your Macintosh process messages as they arrive.

With only one In Tray, software like Beyond's PowerRules (less than $100 per user; 617/621-0095) can sort your mail by project, delete junk mail, automatically reply to routine requests, and page you when priority messages arrive from your spouse or your boss.

Under PowerTalk, every document is a potential mail message. A Mail menu appears in the Finder and in applications that take advantage of AOCE's messaging service. Select the Send menu item, pick the appropriate addresses, add a message title and maybe a short note, and send. The Mail Bar also appears right below the Title Bar in open documents.

Apple expects the Send dialog box to soon be as familiar as the Print dialog box. You will see spreadsheets, word processors, databases, graphics applications, and others send mail as easily as they print to printers. But if your applications don't support the Send function, you can still mail the documents they generate to another user's In Tray via AppleMail; the Spartan E-mail application ships free with System 7 Pro. Other E-mail makers, such as QuickMail creator CE Software, are adapting their more sophisticated programs to run as front ends to AOCE's messaging services, too.

When you send a document, it goes to your PowerTalk outgoing mail folder and stays there until your Mac can deliver the message. (If you have a PowerShare server, the message is stored there.)

PowerTalk also lets you send and receive messages through non-AOCE services, using software called Message System Access Modules (MSAMs). MSAMs act as gateways between the PowerTalk interface and other messaging systems. For example, your In Tray can collect incoming faxes using an MSAM from STF Technologies or capture incoming E-mail from CompuServe using that company's MSAM. With the proper MSAMs you can also send messages on a non-AOCE system, such as America Online or a pager, just as you send PowerTalk messages. Apple hopes all types of messaging systems, including E-mail, fax, pagers, and voice mail, will provide MSAMs so that their services can be integrated into the PowerTalk interface.

MSAMs come in two varieties, server-based and personal. Server-based MSAMs connect entire systems, perhaps bridging the AOCE-based mail system of a Macintosh workgroup with the Message Handling Service (MHS)–based system of a DOS and Windows NetWare workgroup. Personal MSAMs, on the other hand, connect one user with different messaging systems. To add a new system, you just add a new MSAM.

Most MSAMs are being developed and sold separately from Apple's products. Although server-based MSAMs will likely always cost extra, many personal MSAMs are expected to ship bundled with PowerTalk in the future. Today, System 7 Pro's PowerTalk comes with three personal MSAMs: peer-to-peer AOCE mail, server AOCE mail, and dial-up AOCE mail. The dial-up MSAM provides a big bonus to home users. It allows your Mac to phone another PowerTalk user and relay messages. The dial-up MSAM can be configured to call only when you want it to, such as when the phone rates are cheap or when you have many messages waiting to go out. Or you can override the configuration and send immediately.

PowerTalk makes moving your Mac around much simpler. With the I'm At menu item, you indicate which MSAMs are usable at your location (fax from home, network at work, and so on). Then PowerTalk sends documents when it can, using the appropriate setup information.

Directory Services

Not only does the *Enterprise*'s computer offer a universal interface for sending messages, but it also knows where the ship's captain is at all times and what kind of message to send to him. Likewise, AOCE knows about all the ways you communicate with others—QuickMail, Microsoft Mail, fax, America Online, AppleLink—and it handles delivering the message to those persons so that you don't need to remember which messaging system you use to communicate with them.

PowerTalk introduces two new concepts that make automatic message handling possible: the Information Card and the Catalog. The Information Card is a template for storing all kinds of information about one person, such as a preferred electronic-messaging address, a physical address, and maybe notes on hobbies and an ID photo. The Catalog is a collection of Information Cards on the PowerShare server that you (or an AOCE application) can search for specific information.

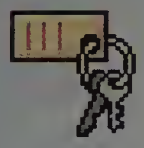
Right now, when you communicate with a variety of messaging systems, you end up with one address book per messaging system. All that information is in your Macintosh, but you must remember that Francis gets messages via fax, Jan has a QuickMail account, and Sandy wants you to use America Online. Information Cards keep all of that information in one place, the Catalog. There are two kinds of Catalogs: personal Catalogs, maintained by each PowerTalk user and stored on each Mac; and server-based Catalogs, maintained by network administrators and stored on PowerShare Collaboration Servers.

THE AOCE DESKTOP

As the first system software to include AOCE functions, System 7 Pro will change the way your desktop looks and works. Here's what to expect.

In Tray Like the Trash Can icon, the In Tray icon becomes a permanent fixture on the desktop. Any document (whether text, sound, QuickTime movie, or fax) sent through any AOCE-compliant application (whether word processor, forms generator, or E-mail) is received by the In Tray.

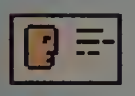
Catalogs Under AOCE, the Chooser is replaced by Catalogs, which contain information not just about network devices, but users or any other information a groupware application might need to operate. This desktop icon lets you search your own personal Catalog or a Catalog located on a PowerShare Collaboration Server.



Key Chain Another new desktop icon, the Key Chain lets you log on to multiple E-mail accounts through a single password.

DigiSign Akin to an official seal, the DIgiSign application allows you to attach a unique, digital signature that guarantees a document comes from you and hasn't been altered.

Information Card Like an electronic business card, the Information Card stores customizable data about users—such as name, address, phone number, and E-mail address. Cards can be stored in searchable Catalogs for use by groupware applications and other users.



AppleMail This simple E-mail application allows you to send any document to another user's In Tray from the Finder, whether the document's creator supports AOCE or not.

Instead of having a separate address book for every E-mail system you use, all your E-mail systems share your personal Catalog. When you send a message, PowerTalk reads your Information Cards and delivers the message to the appropriate messaging system.

But there are advantages to keeping a server-based PowerShare Catalog too. Information Cards can hold additional information about a user. For example, for each employee, a business could add information fields that show supervisor's name, expenditure authority, projects for which the employee is responsible, and who approves that person's expense reports. It's possible to create electronic expense reports that query the Catalog, then automatically route documents (using AOCE's messaging) to the appropriate person for approval.

Another advantage of keeping Catalogs on PowerShare servers is automatic updating. When a change is made on one PowerShare server's Catalog, it is propagated to the other server-based Catalogs on the network automatically. In a peer-to-peer PowerTalk system, users are responsible for updating their own personal Catalogs.

If you find an Information Card you need located on a PowerShare server, you can drag it from the PowerShare Catalog to the personal Catalog on your Mac. If you drag a document onto someone's Information Card, PowerTalk immediately sends the document to that person.

Digital Signature

The number one reason we still use paper is to obtain that scrawl on the bottom of that check, a signature.

With PowerTalk you can put your "signature" onto a digital document. Instead of printing the document and signing the paper, you skip the paper and just sign the digital version of the document.

A signed digital document has many advantages: it travels faster than paper, other programs can process it automatically, and you can avoid the mistakes that can occur when a written document passes through so many hands.

Computers imitate the uniqueness of written signatures with a software key. PowerTalk uses the RSA Public Key Cryptography system, where each signature has two keys: one public and one private. You lock a document with the private key, and recipients unlock it with the public key. You don't need to remember these keys; they are encrypted in the PowerTalk signer with the DES encryption algorithm. All you need to remember is your password to access the signer.

Since anyone can open a document and change it, what does it mean to sign a digital document? How do you know if a signed digital document has been transmitted to you without being altered? PowerTalk uses the Message Digest 5 (MD5) algorithm to summarize a digital document into a unique 128-bit number. Think of MD5 as one big math equation that takes all the bytes in a digital document and pops out one 128-bit number. Alter one bit in the document and it summarizes to a different 128-bit number.

PowerTalk uses the sender's private key to encrypt the 128-bit summary of the attached document and information about who the sender is. All this encrypted information plus the sender's public key is called a certificate. The certificate is attached to the document, and the whole package is the signed digital document.

When you receive a document, you can look at the Get Info window for the document, and if it is signed you will see a certificate icon. When you click on the icon, PowerTalk decrypts the certificate with the attached public key and recalculates the 128-bit summary number. If the newly calculated summary number matches the one that was encrypted in the certificate by the sender, the document has not been altered. Since signed digital documents are impossible to modify, they are actually more secure than paper documents.

When you receive a signed digital document, how do you know that the signature is legitimate and that it isn't from a pretender? In many ways, your digital signature is similar to a credit card: it is issued by a known authority, it has an expiration date, and you can verify its validity. To get your own digital signature from RSA, you take a form to a notary public, who verifies your identity, notarizes the information on the form, and then mails the form to RSA. Based on the notary public's authority to say you are who you claim to be, you eventually receive a disk in the mail with your personal electronic signature. Your electronic signature has a two-year expiration date, and includes verification information. If someone wants to make sure your signature is valid, he or she contacts the issuing authority listed in the certificate. There will be issuing authorities other than RSA. For example, Apple Computer's security department plans to issue signatures to all Apple employees with employee badges.

DigiSign is the PowerTalk application that manages your digital signature. To use DigiSign you can drag and drop a document onto it. DigiSign requests your password and then attaches a certificate to the document. You can verify a signed document by selecting Get Info and click-

ing on the signature button. A dialog box tells you when the document was signed and provides verification information about the person who signed it.

A Cure for Password Overload

I know, you are saying to yourself, "I've got enough passwords already—do I really need another password?" Fortunately, Apple anticipated a world with too many passwords and created the Key Chain, a system extension that stores your passwords. With the Key Chain, all you need to remember is the one password that unlocks the Key Chain in order to access all your services.

Software that is Key Chain–aware first looks to see if your Key Chain is unlocked. If it is, the software asks the Key Chain for the password. The Key Chain gives the password for that software, and you get logged on to that service without entering another password. If the password for that service is not stored in the Key Chain, the Key Chain politely asks if it can retain your password so that you don't have to enter it every time you log on to that particular service.

All the Key Chain controls are located in the Special menu in the Finder. You unlock and lock the Key Chain from the Finder. As with some screen savers, you can have the Key Chain lock itself after a period of inactivity. Although the Key Chain helps manage your passwords, it also has some disadvantages. There is only one Key Chain per computer, and you cannot move that Key Chain. Get a new computer and you'll need to reenter all those passwords into a new Key Chain.

EVERY DOCUMENT IS A POTENTIAL MESSAGE

The other disadvantage is well known to people who use communications software that remembers your passwords: after a couple of weeks of automatic log-on, you will forget the password. The Key Chain has no way to tell you the passwords it is storing.

The major advantage of the Key Chain is that after you unlock it, you can sign documents and send and receive all kinds of messages all day long without entering another password.

Encryption

In "Star Trek," the captain is always getting secured transmissions from Star Fleet headquarters. It's not enough to have paperless documents; you also want to keep them private during transit. Today it's easy to buy a network packet analyzer that observes and decodes every transmission on any network. With wireless communications it's even worse: someone who doesn't even have access to your building can intercept your messages and decode them.

To provide secure transmissions, PowerTalk and PowerShare come with a new AppleTalk protocol: ASDSP, or Apple Secure Data Stream Protocol. ASDSP can encrypt all network communications that go through a PowerShare server, so you know for sure that no one can intercept your messages during transmission. Your Macintosh encrypts messages going to the PowerShare server, and PowerShare servers exchange messages in an encrypted format. Through a service called authentication, you can also be certain that the person you are communicating with is who she or he claims to be.

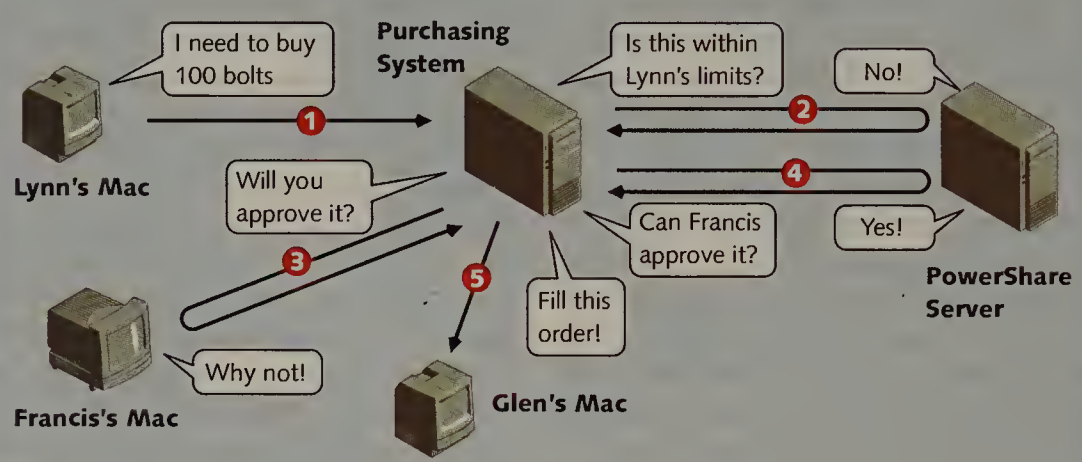
Where No Mac Has Gone Before

So, AOCE isn't science fiction. But it also isn't the *Enterprise*'s computer just yet. As this young technology matures, communicating and cooperating with the rest of the world will get easier and easier. **m**

KEE NETHERY is principal for Kagi Engineering of Berkeley, California. He provides support and training to newly assigned network administrators dealing with large AppleTalk internets in the San Francisco Bay Area.

Workflow Automation: One Use for AOCE

What can you do with AOCE? Automate routine paperwork, for one thing. In this example from Apple, Shana Corporation's Informed Manager 1.4 ($495, 403/463-3330), Beyond Software's PowerRules (less than $100 per user, 617/229-0006), and Claris's FileMaker Pro 2.0 ($399, 408/727-8227) use the AOCE services in Apple's System 7 Pro ($149 for one user; $999 for ten users) and a PowerShare ($999) server to automate purchase requests. AppleScript (bundled with System 7 Pro) automates the process with help from Catalog Tool (prototype software from Shana). AppleScript alone can't control AOCE functions.



1. Request Using Shana Informed Manager, Lynn fills out a purchase request, attaches his digital signature to it, and sends the form through E-mail provided by the AOCE extensions. Invoking the Send command triggers an AppleScript that routes the form to the next logical destination, the purchasing system's In Tray.

2. Review PowerRules, mail-agent software running on the purchasing system, automatically opens Lynn's request. An AppleScript reviews the form. Querying a PowerShare Catalog (on the PowerShare server), the script finds that Lynn's request exceeds his spending limit and so must be approved by Francis, his supervisor. AppleScript logs the request's status in the purchasing system's FileMaker Pro database, so that Lynn can check to see where his form is, if he so wishes.

3. Authorize AppleScript mails the form to Francis. She opens the form in her In Tray and approves the request by attaching her digital signature. When she invokes the Send command, it triggers an AppleScript that routes the form back to the purchasing system.

4. Verify Again AppleScript queries the PowerShare Catalog, this time to find that the request falls within Francis's approval limit. AppleScript makes a note about the form's status in the database and adds the expenditure to Lynn's project account.

5. Order AppleScript mails the completed, approved form to the company purchaser, Glen, and PowerRules opens the form when it hits Glen's In Tray. AppleScript automatically puts the purchase request in a folder labeled Buy This Stuff Today, on Glen's Mac.

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Getting More from E-mail

Tips and tricks for using your electronic-mail system effectively

You probably use electronic mail every day, but chances are you don't use your E-mail package to its best advantage. Sure, you know how to type in a message and hit Send—enough to notify workers of a meeting or to catch up on the status of projects. What more do you need to know? Plenty.

Whether you're a user on a local area network, a remote user dialing in, or the network administrator, learning to exploit your E-mail package's breadth of features can make electronic communication even simpler than it already is.

Something as simple as System 7's drag and drop for messaging can help you reduce keystrokes and confusion, and perhaps most important, save time. Knowing how to dial in to a second mail center can save remote users from panicking if they can't get through to the network immediately. And administrators can avoid the pain of disk shuffling by trolling for E-mail utilities online.

Following are tips and tricks for users of the Big Three E-mail programs for the Mac: QuickMail, cc:Mail, and Microsoft Mail. We've divided the tips by user type—network user, remote user, and administrator—but many of them will be helpful to everyone.

Microsoft Mail

BY BRONWYN FRYER

Network User Tips and Tricks

Keyboard Cuts Want to pick a form or address a message quickly? Don't bother mousing around. Instead, try opening the Note form by holding down the ⌘ key and pressing 1. To select the Phone form, hold down the ⌘ key and press 2. To select the Image form, press 3, and so forth (see "Message-Summary Screen").

When you're in the Addressing screen, holding down the ⌘ key while pressing 1, 2, or 3 shows you the All, Personal, or Local lists. If your network has fax, MCI, or another gateway installed, press ⌘-4 to bring up addressing templates for those gateways.

Wake-up Call If you're a System 7 user who likes to read your E-mail as soon as you boot up, you can set up your system to display mail automatically. First, set your mail workstation to log on automatically by opening the Chooser and selecting MS Mail. Highlight the server to which you want to connect and click on Setup. Select Sign in to Mail Automatically and then Password Entered by System. Enter your name and password in the fields and click on OK.

Now you need to make an alias of the MS Mail Apple menu item so you can fire up Mail automatically. Open your System Folder, then open the Apple Menu Items folder. Select MS Mail and choose Make Alias from the File menu. Drag the alias to the Startup Items folder (in your System Folder). The next time you restart your Mac, it will log on to the server automatically, and the alias will open your message-summary screen. (A warning: This feature lets anyone who can turn on your Mac access your mail, so use it prudently.)

At Your Server Why scroll through the global address list to send mail to everybody at one place or service? Instead, type the @ symbol (shift-2) plus the server name, then click on the Find button. You'll see all the users located at that server. You can also use this trick for addressing through gateways. If, for example, you want to send faxes to several people, you can type **@plusFax** (if that's the name of your fax gateway) to address everyone listed at that gateway.

See Enclosed If you're a System 7 user and want to enclose documents automatically when you send messages, a handy utility called MS Mailer, stored in the Utilities folder on the Microsoft Mail

Workstation disk, lets you do so. (If you don't have this disk, ask your network manager for it, or download the utility from the online systems discussed later.

Use System 7's drag-and-drop feature to drag enclosures to the MS Mailer icon or just double-click on the icon. You'll see the MS Mail Note From screen. Address the note, click on Enclosure to enclose the document, choose Send, and your documents are on their way.

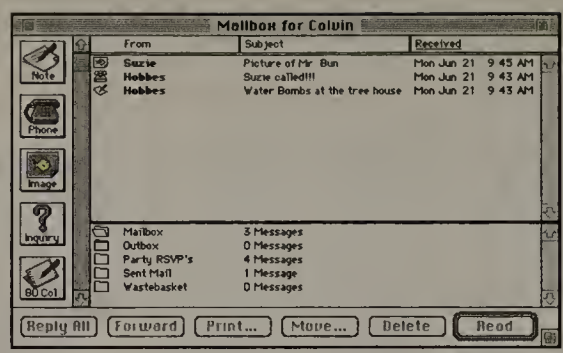
MS Mailer can also store a preaddressed and filled-out cover sheet for your enclosures. For example, if you want to preaddress and forward weekly reports to your boss, drag the report to the MS Mailer icon. Hold down the control key while double-clicking on the icon; you'll see the MS Mailer configuration screen. Choose Edit Message; fill in the message text, address, and any options; then choose Done. The message text and settings are automatically saved with Mailer.

Switch and Bait Let's say your boss is away and you need to check her mail as well as your own. Instead of going through the hassle of choosing a server, then logging on under her name using her password, you can configure her account to appear as a menu item in your own.

First, find Mail Switch in the Utilities folder on the MS Mail Workstation disk (if you don't have this disk, ask your network manager or download the utilities from an online system), and double-click on the Mail Switch icon. From the File menu, choose Configure Accounts, then click on Add. A screen listing the account information will appear. Choose a zone and a server, a user name, and a password, then choose Add. Select Done when you are finished adding accounts. (You can password-protect Mail Switch by setting a Mail Switch password; from the File menu, choose Change Password and follow the instructions.)

Stacks of Mail Want someone to handle your stacks of E-mail while you're away? Check out a HyperCard stack, available on your network manager's Extras disk. In the HyperCard folder, you'll see a stack titled Out of the Office. You can configure this stack to tell people who send you messages that you're out of the office, to call someone else for help, when you'll be back, and more.

To configure Out of the Office, double-click on its icon. You'll see several selections: in a meeting, out to lunch, on an errand, traveling, and on vacation. Or you can create your own message in a user-definable field (see "Out of the Office HyperCard Stack"). You can also add comments in a Comments section. Click on Options for more-in-depth features—for example, to respond to mail addressed directly to your account, or to forward your mail to another user while you're away. When your configuration is complete, hit Start.



Message-Summary Screen To pick an MS Mail form or to address a message quickly, hold down the ⌘ key and press 1, 2, or 3 to access the Note form, the Phone form, or other forms.

Out of the Office HyperCard Stack MS Mail's Out of the Office HyperCard stack lets you set up automatic replies to your mail while you're out of the office.

Remote-User Tips and Tricks

Getting the Newest List Want to make sure you have the most current address list while you're on the road? Select Preferences/Other, then uncheck Enable Off-line and recheck it. Now choose Update to receive a download of the most recent list.

You Can Take It with You If you want to take your mail with you on the road, you can store your messages in local folders on the hard drive of your PowerBook. To create a local folder, just select New Folder under the Mail menu. A dialog box prompts you to enter the name for the new folder (for example, Mail for My PowerBook). It also asks you to choose between storing this folder on the mail server or storing it locally. Select On This Computer (Locally). Your local folder will be marked by a black tab, and anything in it will be available to you whether you're at 35,000 feet or on the street.

Administrator Tips and Tricks

Let Your Modem Do the Walking Why fish through manuals or shop around for shareware? Instead, use an online service to get access to handy utilities and add-ons, 24-hour technical support, information on third-party gateways, working demos, bug-fixes, and HyperCard tools.

If you're a CompuServe user, type **GO MSWRKGRP** at the CompuServe prompt for these tools and services. If you use AppleLink, you'll find the same files by opening the Third Parties folder, then the Microsoft, Mail, and File Area folders. If you don't have AppleLink or CompuServe, don't worry: just set your communications package to 8 data bits, no parity, 1 stop bit, then dial the Microsoft Download Service (MSDL) at 206/936-6735. When you download a file, you receive it in a self-extracting archive.

Network at a Glance Want to see everything about your mail network—disk space, gateway throughput, number of users, load balance, and so forth—at a glance? Check out a new utility called Statwizard+, available from any of the online services. Statwizard+ is an Excel-based macro that allows you to produce up to 15 different graphical reports about your Microsoft Mail server and your entire network. Just download the utility and open it using Excel 3.0 or higher. A detailed Read Me file shows you how to get the information you need, how to run the report, and what you can determine from each chart.

No-Wait Upgrades To upgrade MS Mail server software, you don't have to stay until the other users clear out. Instead, upgrade your servers as you perform your routine backup. From the Extensions folder (within the System Folder), drag the Microsoft Mail Server icon to the desktop. Now drag the new Microsoft Mail Server icon from your upgrade disk to the Extensions folder. During your next automated backup cycle the server will be automatically upgraded. You will also get a backup of your data files as they existed just before you began the process.

To upgrade workstation software, without going from machine to machine, copy the Installer disk to an AppleShare volume while logged on as a guest user. Select the Installer program, select Make Alias from the File menu, sign on to Mail as a guest, and enclose the alias of the Installer program for each machine you want to upgrade. When users receive your message, they download the attached alias and double-click on it; the Apple Systems software automatically mounts the remote volume and upgrades the workstation software.

Forms and Function If you've created custom forms for monthly reports, purchase orders, and the like, you can install them on MS Mail so that everyone can use them. Log on to the server where you

want the form to reside, then open the stack of the form. Compile all components of the form (the Send screen, the Read screen, any icons, and Printed Form). Now, double-click on the Form Mover icon.

In the Form Mover screen, select the installation option you want for the form. You can either allow users to send/read messages along with the form or to read messages only. When you're done, click on Install. In the new dialog box, choose the position of the form in the Summary screen. Click on Install to install the form on the server and return to the Form Mover screen. Click on Done to return to the form's title screen.

Card Tricks If you like the functionality of the Out of the Office stack (discussed earlier), you can write your own specialized stacks. For example, you can build a bulletin board application, or create applications that let users print their personal address lists or all the messages in their Summary screens. The HyperCard SDK (software developer's kit), located on the Extras disk, lets you use the HyperCard scripting language to make specific calls to the MS Mail server.

Lotus's cc:Mail

BY NANCY DURLESTER

Network User Tips and Tricks

Using Drag and Drop You can open multiple windows in cc:Mail, and you can set up your screen so that it shows only the program components of interest to you—say, the in-box, the folder list, and the bulletin board list. Then you can easily drag and drop items between the elements appearing on screen as you address messages and receive and send attachments, files appended to a message.

You can use the drag-and-drop feature in preparing a new message that will be sent to a mailing list. First open the Mailing List option. Then begin a new message by clicking on Address. From the Mailing List option, click on the mailing list to which your message will go, drag the list to the newly created message, and drop the list on the address pane of the open message. Complete the text of the message and send it on its way.

Create Private Mailing Lists Individual users can also use the drag-and-drop feature to create private mailing lists.

For example, say you're on a new committee, and you need to communicate with all committee members via E-mail. When the leader sends the first message to everyone on the committee, you can use that message to create your own mailing list. First select File, then choose New from the Mailing List Options menu, and enter a name for the committee mailing list—Committee, for example. Next, open the message from the leader and select the Reply All function, which highlights all the names in the address list. Then just drag and drop the highlighted names to your Committee mailing list.

Your list now includes all of the names that received the original message. Make sure to choose Cancel before replying to the original message.

Custom Notification Sounds To create custom sounds, open the Sound control panel. Record a sound (you need a Mac with a microphone) and save it to the desktop. Launch cc:Mail Notify, click on the Sound option, and select the newly created sound (see "Custom Sounds"). When a new message arrives, cc:Mail notifies you with your custom sound. Or you can launch cc:Mail and choose Preferences, New Sound from the File menu.

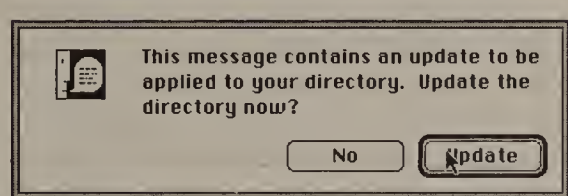
Get Attached To save an attachment you receive via cc:Mail, simply drag and drop the attachment to the desired location.

Macintosh users often encounter difficulty reading attached files, especially those generated by DOS PC applications. The cc:Mail Extend Viewer system can help you read messages directly; hold down the option key and double-click on the file attachment, and the file contents appear. A limited set of translators ships with cc:Mail, but third-party developers, such as DataViz, offer more-complete sets of translators.

For Macs running System 7, attaching a file to an outgoing message is easy. You can use the Finder to locate the files you want to attach. If you have more than one file to attach, use the shift key to highlight them. Then drag and drop those file icons over the cc:Mail application icon. The system automatically launches cc:Mail. Prepare a new message and include the file as an attachment. To complete the process, simply address the message and send it on its way.

Moving Forward If you have a message in your in-box that contains attachments you wish to forward to someone else, simply drag that message into the attachment pane of an open message window. The attachments are automatically added to the open message.

Custom Sounds Launch cc:Mail Notify and select the newly created sound you wish to hear when messages arrive.



Remote Directory Updates Save new remote users the trouble of manually entering names in their directories by mailing them a directory update. If they accept the update, cc:Mail builds the directory for them.

Remote-User Tips and Tricks

Keeping Up-to-date While on the road, you can take advantage of a program that automatically sends directory updates to your PowerBook, but the updates will not propagate to the home directory on your office Mac.

To use your updated PowerBook directory to update the directory on your office Mac, process the updates in the directory on your PowerBook but don't delete the messages. Upon returning to the office, forward the directory-update messages from the PowerBook to yourself. When you log on to cc:Mail on your office Mac, you will receive the directory updates again.

Adapting to Circumstances As a remote user, you probably have to alter access phone numbers to reflect your dialing location. For example, a hotel requires that you dial 8 for an outside line, but at home you dial direct. Typically, remote users have had to manually change the phone number each time the circumstances changed.

To simplify this process, create a file with your favorite text editor (such as TeachText) that includes all frequently used phone numbers and a description of each number. Save the file with the name Apple Modem Tool Phone Numbers, and place it in the Preferences folder for Macs running System 7, or anywhere in the System Folder for Macs running System 6. From the Remote menu within cc:Mail, choose Configure Home Post Office. A pull-down menu appears with the numbers and descriptions; select the option for your circumstances.

At Home with DOS If you still haven't upgraded to the Mac version of cc:Mail Remote, you can continue to run Insignia Solutions' SoftPC and the DOS version of cc:Mail Remote. SoftPC allows DOS programs to run on the Mac. But cc:Mail is now offering a special Mac update for users of this configuration. Contact cc:Mail for information on this upgrade.

Administrator Tips and Tricks

Finding a Fix One of the best ways to get the latest information on cc:Mail for the Macintosh is to use cc:Mail's BBS. Although you cannot download some items without a password from technical support, you can download many items—including the latest bug-fixes, new programs, and Read Me files. And as the administrator, having access to patches and fixes as soon as they're available can prevent problems.

When you log on to the BBS, a Macintosh Updates section appears in the File Areas menu—an option unique to the Mac product. Additional information is available under the General Information, Public Utilities, and cc:Mail Remote Update areas. The cc:Mail BBS shows you the new files available since the last download. You should log on to the BBS on a weekly basis to keep current on all new information. The cc:Mail forum on CompuServe is another good source for technical information.

A Temporary Change When a local cc:Mail user logs on to cc:Mail Remote from the road, a copy of all downloaded messages appears in that user's local in-box. But when the user returns to the office, sorting and deleting unwanted messages can be time-consuming.

To lighten the load for your users, you can manually change a user's status from Local to Remote for the period of time they are on the road. cc:Mail does not copy the messages of remote users to the local in-box, eliminating tedious cleanup later. Remote users can download and keep important messages by archiving to a floppy and retrieving back into their local in-box upon returning to the office.

Directory Assistance When initially installing cc:Mail Remote, users must manually enter names in the cc:Mail directory, which can be time-consuming. To expedite the process, you can use the Directory Exporter utility to create a file (called Ccmupdat.Exp) that includes all entries in the local cc:Mail directory. Attach this file to a cc:Mail message and send it to the new remote user.

When the user dials in, the message looks like an automatic directory exchange message (see "Remote Directory Updates"). Once the user reads the file, cc:Mail Remote alerts him or her that a directory update message has been received and provides the option to process the message. If the user answers yes, cc:Mail automatically updates the user's directory.

An important point for PowerBook users is that cc:Mail recommends operating with AC power (plugged in) as this update may take a long time, depending on the length of the directory.

CE Software's QuickMail

BY MATTHEW CLARK

Network User Tips and Tricks

Group Dynamics With QuickMail, you don't need to type an entire group name when addressing messages. If a group is in the address book, type a space and then the first one or two letters of the group name. QuickMail does the rest.

Enclosures Where You Want Them Although QuickMail's default storage area for enclosures is the Apple Menu Items folder, you can assign your own default storage area. In System 7, retrieve enclosures outside of the Apple Menu Items folder by placing the QuickMail Desk Accessory in the location you'd like to assign as the default storage area. Then make an alias of the DA and include it in the Apple Menu Items folder. Your enclosures will be stored wherever you place the QuickMail DA, leaving the Apple Menu Items folder free of E-mail clutter.

Think Globally Send E-mail to Internet through the QM-Link Gateway by including **#INTERNET** after the Internet address in the special address dialog box. With a CompuServe gateway, type **INTERNET:** before the Internet address.

Messages to Text Save multiple messages to a single text document by shift-clicking the messages to be saved, then clicking on the Save button. A tab-delimited feature exists for exporting messages (see "Timesaving Techniques").

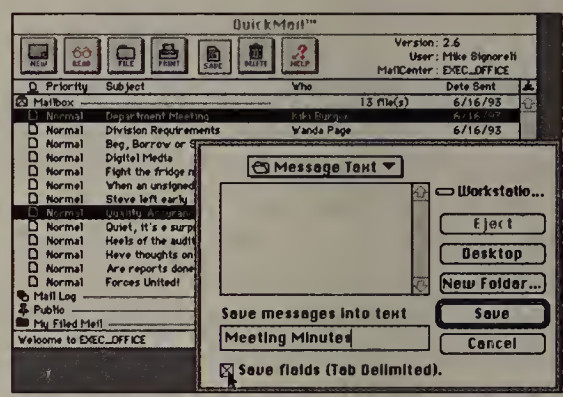
Remote-User Tips and Tricks

Call Any Mail Center You can call any mail center (mail server) that supports remote connections. This capability is helpful in emergencies; when you must get through but can't reach your usual mail center, you can try another. QuickMail's NameServer resides at each mail center and is a global directory of addresses, so you aren't required to dial in to one particular mail center.

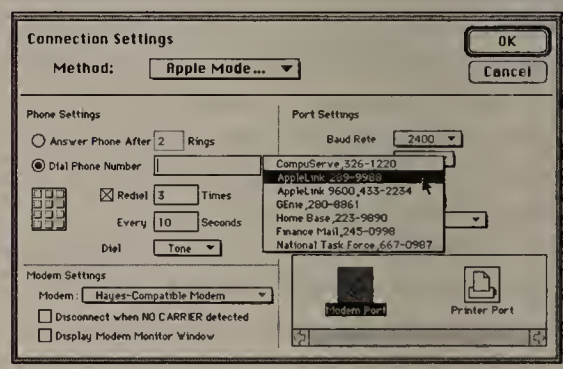
The Form Factor If you have a PowerBook with a slower modem (say, 2400 bps, instead of 9600 bps), try connecting to QuickMail using a separate communications package with light memory requirements, such as ZTerm. Communications packages will strip out any fancy QuickMail message forms and download text only, saving the additional time and space forms require.

Remote Filing Instead of filing your E-mail with QuickMail Remote, save it as a graphic or text file. The mail is then saved as a QuickMail Remote document and can be saved to any location on your hard drive. You won't have to search through the System Folder for filed mail items.

Modem Tool Multiples Need to connect to multiple mailboxes on multiple mail servers, but hate remembering and typing in all those phone numbers? Store multiple phone numbers using the Apple Modem Tool (v.1.1.1 or later). Create a text file with the location name and phone number, separated by tabs, one entry per line. Name this file Apple Modem Tool Phone Numbers. Save it to the Preferences folder within your System Folder. The Apple Modem Tool will then include a pop-up menu of names and numbers beside the Dial Phone Number button in the Connections Settings dialog box (see "A Memory for Numbers").



Timesaving Techniques Save multiple messages at once by double-clicking to highlight the target messages and choosing Save from the QuickMail main window. You can save the message fields in tab-delimited format.



A Memory for Numbers Create a convenient pop-up menu of QuickMail mail center names and phone numbers, instead of typing in each by hand. All it takes is the Apple Modem Tool and a simple text file.

Administrator Tips and Tricks

A Phone Call Away As an administrator, you will want the most current information on QuickMail as well as technical support. You can dial in to several online services: America Online, CE Software; AppleLink, CE.Support; CompuServe, 76004,1527; GEnie, CE-Support; Internet, ce_support%cedsm@uunet.uu.net. These services are also available through CE Software's QM-QM Bridge at 515/224-1721.

Train Them Well If you can get your users into the habit of filing their E-mail messages, you can free up server disk space. By filing messages, users relocate them on their own hard drives. Use the Mail Usage Report in the Utilities menu on the QuickMail server for a look at who uses E-mail most frequently. You probably want to check with these users first to make sure they are filing (or deleting) messages regularly.

Clear Away Clutter QuickMail 2.6's Mail Authentication tool can help optimize mail centers by authenticating QuickMail files, backing them up, and moving corrupt files to the Dead Mail box.

In QuickMail, the message file and the Directory and Mail Log files required for listing a particular message in a user's Mail Log or Mailbox can sometimes become corrupt. When the original QuickMail message file is corrupt, the Directory and Mail Log files are no longer connected to it and therefore become useless. The Mail Authentication tool sifts through all files (one mail center at a time) and determines which are valid and which can be deleted. It then moves the authenticated files to a separate directory. You can choose to handle corrupt files in one of three ways: ignore them (if you want to simply erase over your old mail center with the new one), move them to the Dead Mail folder, or install them in the correct user's account.

Mail authentication can significantly reduce the amount of server space your mail center consumes.

A Common Zone or Topology Moving mail centers to a common zone or topology can reduce network traffic, especially in large organizations running multiple mail servers. Usually the traffic between two mail centers is as critical as the traffic to and from end users. If your company has QuickMail mail centers on different wiring topologies (LocalTalk, Ethernet, and so forth) the communication lines between two QuickMail servers can involve multiple zones. Every hop that your mail center needs to make to another zone is another speed bump in sending traffic to another QM center.

FOUR WAYS TO AVOID DISASTER

Regardless of what E-mail package you use, there are some simple ways to head disaster off before it strikes. Here are four tips that administrators should take to heart:

1. Read the documentation that accompanies your E-mail package *before* disaster strikes. Don't just use the documentation for reference once things go wrong.
2. Consider your backup routine. Think about how long it would take you to completely restore your E-mail structure from backup media, then go a step further and perform a full restoration of your mail center (or mail server). If the actual restoration time exceeds two hours, consider alternatives. Several products allow you to back up mail centers to shared volumes, such as an AppleShare file server. Backing up and restoring from shared volumes can be faster than backing up and restoring from tape.
3. Be aware that the more time you spend showing users the proper ways to use E-mail, the less time you will spend cleaning up electronic messes. If you just don't have a lot of extra time to spend with new users, consider asking your human resources department (or whoever is responsible for new-employee orientations) to offer E-mail training classes.
4. Remember that giving remote users a phone number and a modem really isn't enough. Provide remote users with a road map for navigating your E-mail system. Outline the various options for accessing the mail system. Sit down with remote users and go through the steps for connecting to the network. The time you spend educating remote users now is time you save trying to troubleshoot over the phone later.—MATTHEW CLARK

The Right Router On a small network, install the QuickMail server software on the same machine as a software router such as Apple's Internet Router or Farallon's Liaison.

Installation at the router provides the fastest access possible to mail services from the networks attached to the router. Of course, you will want to use a machine with a lot of horsepower (RAM and clock speed), since you'll be performing two critical network operations on it. The downside of this setup is if that machine goes down, you lose both services, so be prepared with an alternate CPU.

Make It Redundant If your mail centers are absolutely critical to the functioning of your organization, you should build in server redundancy.

You can use DiskTwin from Golden Triangle Computers to create a mirror image of the server's hard drive. That way, if that disk drive fails, DiskTwin automatically mounts the twinned volume and you should experience no downtime whatsoever. The drawback is that it's expensive to implement. DiskTwin has a street price of about $700. On top of that, you have to add the price of an additional hard drive.

A less expensive solution is TwinIt, which is also from Golden Triangle. Its street price is about $175. The main drawback of this product is that you must manually mount the twinned volume; it doesn't automatically switch.

Help in Troubleshooting Make troubleshooting a breeze by including a generic text file named QuickMail Report in the System Folder on the server Mac. The next time QM Administrator is launched, it will log all transactions occurring on that QuickMail server. This log will be of great value in pinpointing problems. But use it only for short periods of time (and delete its contents between uses) because it grows quickly, consuming more and more server space.

International Relations Improve your international modem communications by setting the S registers for your modem.

This setting increases the time the modem waits for connections. The S7 register should be set from 90 to 180, depending on how far away the remote location is. Other registers (S9 and S10) can also be set for longer response times to remote signals. **m**

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MATTHEW CLARK is a former wirehead who now calls Macworld Lab home. His true power comes from holding the only copy of QM Forms in the building.

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Circle 48 on reader service card

BY CARY LU

PowerBook Notes

PowerBook Utilities

POWERBOOK USERS HAVE MANY SPECIAL concerns that users of desktop Macs typically don't have. How long will the battery last? Is AppleTalk turned on (when connecting to a network)? Is AppleTalk turned off (to save power)? Although System 7.1 provides the essential controls for running a PowerBook, many of its controls aren't very convenient to use.

Four companies offer PowerBook utilities that attempt to meet the common needs of PowerBook users. "PowerBook Utilities Compared" summarizes these four packages along with the features built into System 7 and Apple File Assistant—a synchronization program with some additional features.

What They Offer

The four utility packages—Connectix PowerBook Utilities (CPU), Symantec's Norton Essentials for the PowerBook, Inline Software's PBTools, and Claris's Power To Go—share the following key features (none, except cursor tracking, are in Apple File Assistant).

• **Battery management** All the utility packages display an estimate of the remaining battery life. The Battery desk accessory that comes with all versions of System 7 shows only the battery voltage, a very rough indicator of battery life. All four utilities monitor not only the voltage but also the current operational modes (such as backlight brightness, processor speed, disk drive on/off, modem on/off) to estimate the remaining power, although these estimates are not particularly reliable. CPU and PBTools improve on the estimate somewhat by taking into account prior battery performance. CPU does not distinguish between batteries, so switching to a partially discharged battery or to a different-capacity battery can throw CPU off; PBTools can track up to four batteries, but you must change a setting in the program whenever you change batteries. PBTools also keeps a PowerWatch—a minute-by-minute record of the voltage and operational modes—and lets you display a graph of voltage levels for the last six hours of operation of each battery. You can export the PowerWatch data to a spreadsheet to compare performance between batteries or check for battery degradation over time. Only users for whom battery operation is critical—who are planning for an expedition, perhaps—will benefit from this information.

• **Power and sleep management** All the packages give you more control over power management. While System 7.1 gives you just one control with four preset times for both system and hard disk sleep, the utilities let you independently set the processor speed, when the system goes to sleep, when the hard disk goes to sleep, and when the backlight dims or turns off. All let you set these parameters separately for battery and AC operation.

• **Status displays** Beyond battery level, most packages offer additional status displays. The displays can be in the menu bar, in a pull-down menu, or on the desktop. Displays on the desktop (System 7, Power To Go) use little horizontal ribbons that take up space you may want for documents; none of the utilities offer a vertical display that could be placed to the right of the disk icons, out of the way. Some packages crowd the menu bar with so many indicators that some of them must cycle—for example, swapping the date and time every few seconds—a possible distraction. Fortunately, you can usually turn off display components.

• **Security** All the utilities offer simple passwords without encryption for protecting data against casual snoopers.

• **Keyboard shortcuts** All four packages offer key commands to perform such common actions as system sleep, drive sleep, and wake up. It's a good idea to put a sticker with the key combinations next to your screen.

• **Keyboard mapping** Two programs map function keys found in the extended keyboard—control–up arrow is page up, for example. CPU maps all function keys; PBTools maps just four of them but allows compound keys, such as ⌘–page up.

• **Cursor find and enhance** All the packages help you track the cursor by briefly superimposing a bull's-eye or some other indicator over it; they also let you thicken the cursor and in some cases change its shape. Apple File Assistant has an unusual Mouse Tracks setting, which briefly shows the trail left by a cursor moving across the screen. Power To Go reaches for overkill with 21 ways to animate the cursor. These cursor features are usually unnecessary for active matrix screens, unless you are working outdoors without backlighting.

continues

PowerBook Utilities Compared*

	POWERBOOK UTILITIES				APPLE SOFTWARE	
	Connectix PowerBook Utilities 2.0	Norton Essentials for the PowerBook 1.1	PBTools 1.1	Power To Go 2.0	Apple File Assistant 1.0	System 7.0/7.1
General						
Company	Connectix	Symantec	Inline Software	Claris	Apple Computer	Apple Computer
Phone	415/571-5100	408/252-3570	203/435-4995	408/987-7000	416/477-5800	416/477-5800
Toll-free phone	800/950-5880	800/441-7234	800/453-7671	800/325-2747	800/776-2333	800/776-2333
Price	$99	$129	$99.95	$99	$79	included with PowerBook (upgrade 7.0 to 7.1 $34.95)
Modular installation	no, except for synchronization	yes	no	yes	yes	yes
Storage requirements	65K–75K RAM, 235K disk (doesn't include synchronization)	160K RAM, 355K disk (doesn't include synchronization)	56K RAM, 122K disk	200K RAM, 634K disk; add 300K RAM, 120K disk for compression	33K–671K RAM, 96K–561K disk	varies
Status Controls						
Battery-status display	voltage; time/ percent remaining; slow/fast charging	voltage; time/ percent remaining; slow/fast charging	voltage; slow/fast charging	voltage; time remaining; slow/ fast charging	no	voltage
Other status displays	disk activity; time remaining until system or disk sleep; processor speed; date/time	AppleTalk; disk spin; caps lock; date/time; security	AppleTalk; disk spin	disk/modem activity; time remaining until system or disk sleep; processor speed; date/time	no	caps lock
Status-display location	menu bar	menu bar or pull-down menu	menu bar	desktop, except for disk and modem activity in menu bar	not applicable	desktop, except for caps lock in menu bar
Other Features						
Keyboard mapping	all 21 function keys; no compound keys	no	maps home, end, page up, page down; compound keys	no	no	no
Cursor control	show location; thicker I-beam	show location; many cursor shapes	show location; thicker I-beam and crosshair	animation with adjust-able motion sensitivity; cursor can indicate disk spin-up; thicker I-beam	show trail left by moving cursor; thicker I-beam	no
AppleTalk options	toggles on/off; can force load	automatically toggles on/off; can force load	toggles on/off; can force load	no	no	switch on/off in Chooser
File synchronization	yes	yes	no	no	yes	no
Disk compression	no	no	no	yes (StuffIt Space Saver)	no	no
Save configuration	by user or task	by application for power management	no	by user or task	no	no
Miscellaneous	keyboard control of pull-down menus and dialog boxes; toggle applications	64-character note-pad with password; mount server when reconnecting to network	battery discharge for cycling NiCad battery	menus drop down automatically when you point at items in menu bar	deferred printing; save RAM disk; mount server when reconnecting to network	
Strong points	best-balanced utility package	flexible installation	best at monitoring battery activity	includes disk com-pression; the most configurable pro-gram; excellent manual	works best in conjunction with Power To Go	price is right

*See text for features common to all four utilities packages.

continues

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- **AppleTalk toggle** Most packages can toggle AppleTalk on or off as required; CPU, Norton Essentials, and PBTools can override the Chooser setting to force loading of AppleTalk, so it's always available without requiring you to restart the PowerBook. Norton Essentials switches AppleTalk on and off automatically.
- **Modular installation** Packages can come either as a monolithic program—which saves some RAM, provided you want all the functions—or as a modular program, in which you can install only the functions you want.
- **Disk compression** Only Power To Go offers disk compression by bundling the $59 StuffIt SpaceSaver. (See "Real-Time Compression," *Macworld*, August 1993, for a thorough discussion of the pros and cons of disk compression.)
- **Ability to save configurations** Three packages let you save some or all of their settings so you can set power management independently for each application (Norton Essentials) or set the entire feature for different users or tasks (CPU, Power To Go).
- **File synchronization** Two of the utility packages plus Apple File Assistant offer file synchronization, which is a valuable feature if you use a PowerBook in conjunction with a desktop Mac. All three have roughly equivalent features and all work well for a single user with two Macintoshes. See *PowerBook Notes*, April 1993, for more information on synchronization.

Overall, I recommend Connectix PowerBook Utilities as the first choice for PowerBook utilities. PBTools offers comprehensive power-management features without a lot of frills. Norton Essentials makes sense for users who want to install only certain features. Consider Claris's Power To Go for its compression and possibly if you find some entertainment value in its animated cursors. Apple File Assistant is a different kind of product; aside from automatic backlight dimming, it includes no power-management features. However, File Assistant does blend seamlessly into the system software—except for its synchronization function, which is separate from the rest of the program and requires System 7.1 for full implementation. Claris planned its Power To Go features to minimize overlap with File Assistant, so the two packages work very effectively together. Whichever package you buy, shop around; many vendors offer attractive bundle deals with these utilities. **m**

CARY LU is a *Macworld* contributing editor and author of *The Apple Macintosh Book* (Microsoft Press, 1992).

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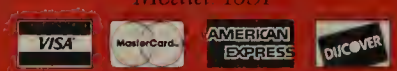

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BY DAVID POGUE

Grammar Crackers

In which grammar programs are pitted against a human editor

GUESS WHAT CLARIS, POWER Up Software, Now Software, NewTek, America Online, Computer Friends, and WordStar International have in common. In the past year, all have published ads or software containing the same grammatical error. They put an apostrophe into the possessive word *its* (as in "click its button").

The computer world, for some bizarre reason, is heavily populated by writers without a good grasp of grammar. The grossest gaffes seem to be the *its* problem, run-on sentences, and the inability to distinguish between *that* and *which*.

But what's a person to do? Grammar-checking software used to get the big thumbs-down from every reviewer on earth. The computer, it seems, can't actually comprehend what you've typed. It can only compare your sentences with a series of predefined patterns or rules. The more sophisticated these rules, the more accurate the grammar checker.

For example, it's a cinch for grammar checkers to catch missing close-quote marks (or close parentheses), inadvertently repeated words, and use of the passive voice ("A rooster could be heard"). But they're oblivious to many word-order and sense problems that would leap out at a human ("Frozen in a tiny glass bottle, Erica turned in her blood sample").

As the years have gone by, some grammar programs (MacProof, Sensible Grammar) have left the market. Others have been improved. I thought it'd be fun to find out exactly how correct is correct, to pit the software against one of *Macworld*'s own crack editors.

Grammatik 5 for Macintosh

Grammatik 5 ($99; WordPerfect Corporation, 801/225-5000) works like most of the grammar checkers: you launch it as a stand-alone program. You open a word processor document (non-Fast-Saved Word, WordPerfect, ClarisWorks, WriteNow, text-only files, and so on). Like a spelling checker, Grammatik scans your document until it finds what it considers to be the first error. A separate window explains the problem.

Like that of most grammar checkers, Grammatik's advice is sometimes dead-on, but more often loony. For example, consider the perfectly fine sentence "She gave him a loving, gentle smile." First Grammatik scoffs: "You may have two independent clauses incorrectly joined." If you click on Next Problem, you're also told: "'A' is not usually used with an uncountable noun such as 'loving.'" To be honest, I'm not even sure what it's complaining about, let alone how to fix it.

Grammatik does everything else a grammar checker can do: provides an online grammar guide, checks your spelling, lets you switch off grammar rules you don't need, lets you edit the document as you check it (and then rechecks your edit), and so on. Grammatik scores a couple of other brownie points, two for coming bundled with WordPerfect or WriteNow 3.0.

But all the spit and polish on earth can't make up for less-than-brainy computerized rules. From a possible 35 points on my Elements of Style Torture Test, Grammatik scored –11. That is, it was wrong more often than it was right, about what you'd expect, I guess, from a program whose name contains a typo.

RightWriter for the Mac 5.0

RightWriter ($49.95; Que Software, 317/573-2500) doesn't check spelling. In many other crucial ways, however, it's superior to Grammatik. First, it's right more often; it scored –6 on the Torture Test. Second, RightWriter shows you the problematic text in the context of the full document. (Grammatik, by contrast, shows only one sentence at a time—in the icky Monaco font, yet—so you can't see the surrounding text.) Third, the interface is more refined, eschewing Grammatik's blocky Chicago-font comments in favor of your chosen font.

Above all, though, RightWriter's creators are much more sensitive to the general weaknesses of computerized grammar checkers. From page one, the manual stresses that RightWriter will do its artificially intelligent darnedest to assist with your writing but that, in the end, it is only a dumb computer. Better still, RightWriter's grammatical suggestions are much more timid than Grammatik's. When your sentence begins with "And," for example, it shyly asks: "Should the sentence start with a conjunction? Some writers consider starting a sentence with 'And' to be poor writing style." The software's charming low self-image makes its incorrect comments easier to forgive.

Insecurities or no, however, one feature of RightWriter is unforgivable: it's blind to curly quotes, curly apostrophes, long dashes, and any other symbols you type using the option key. As a result, it's constantly suggesting that you've left out all your apostrophes and messed up your syntax. If your word processor, like Word, can instantly replace all curly quotes with straight ones, do so before running your document through RightWriter. Otherwise, RightWriter's writers need to get it right.

continues

Correct Grammar 3.2.1

Correct Grammar ($99; WordStar International, 415/382-8000) floored me by actually being right more often than wrong. It caught the run-on sentence that Grammatik and RightWriter missed. It pounced on a sleeping cliché that the others let lie. It even corrected a who/whom muddle that would seem to require actual human understanding to straighten out. Its final Torture Test score, in fact, was a positive 8, the best of the bunch.

I'm not saying that Correct Grammar is glorious. It makes its share of imbecilic mistakes. (About the sentence "Its multicolored main screen shows everything," the program offers this hideous advice: "Consider *it's* instead of *its*." No! Please, *no!!*) And—embarrassment of embarrassments—the word *loose* appears in the program's manual where the author meant *lose*.

Nevertheless, Correct Grammar is a well-designed, simple-to-use program, and it is much less idiotic in its comments than some of its rivals.

Microsoft Word 5.1a

Until I looked at Word, Correct Grammar had been the only program to discover the missing *as* in the sentence "My opinion is as good or better than his." Ditto with the run-on sentence. Ditto with the who/whom business. Then I checked the Torture Test scores: Correct Grammar and Word performed almost identically. Something was fishy. The fine print in the manuals makes all clear: Word and Correct Grammar, in fact, use essentially the *same* checker, based on Houghton-Mifflin language technology.

continues

CHECKING THE CHECKERS

To get a general feel for the effectiveness of these grammar checkers, I sicced each on a wide variety of writing samples: fiction, technical documents, correspondence, and so on.

To come up with a standardized score, however, I let each program loose on a document containing 35 passages, right and wrong, from the classic guide to better writing, Strunk and White's *The Elements of Style*, third edition (Macmillan, 1972). (If you're really compulsive about living electronically you can also get *The Elements of Style* in disk-accessory format from Microlytics, 716/248-9150.

Each time a checker correctly flagged a mistake, I awarded a point. Likewise, I awarded a point for each correct sentence that the checker left alone.

On the other hand, whenever the grammar checker failed to catch an error, I subtracted a point. Each time a checker marked an error where there wasn't one, I also took away a point.

Finally, every now and then, an electronic or human checker found a genuine error in a sentence that's cited in *The Elements of Style* as a correct example! For this impressive act of bravery and diligence I awarded two points.

For further insight into this test, log on to America Online and visit the Macworld Online area. I've posted the test document there, complete with notes and each program's score.

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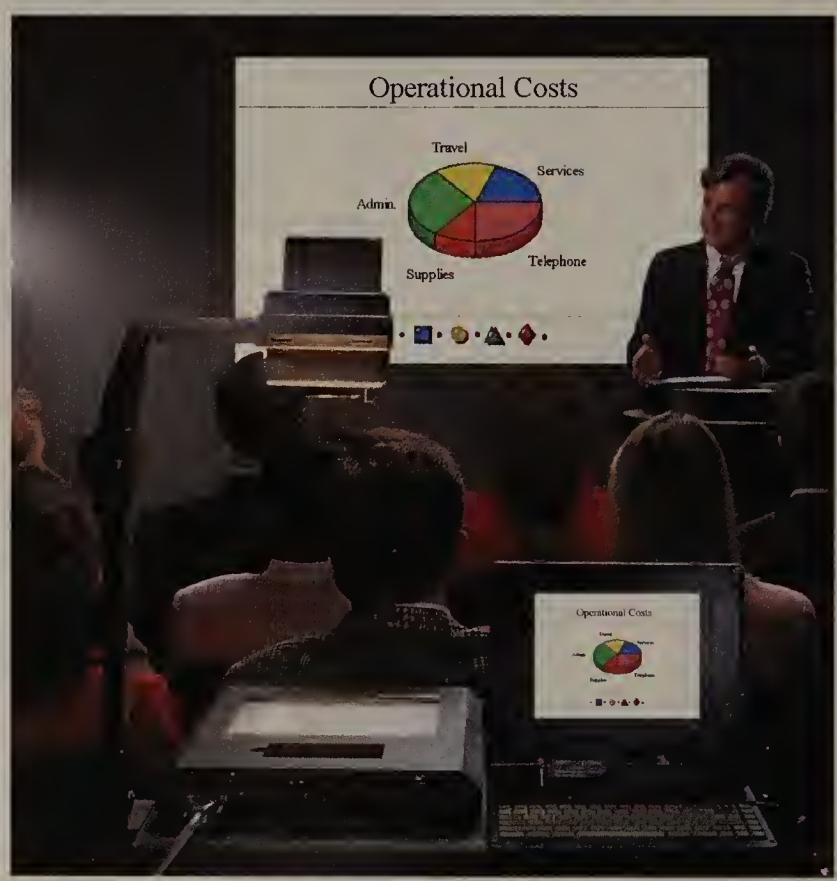

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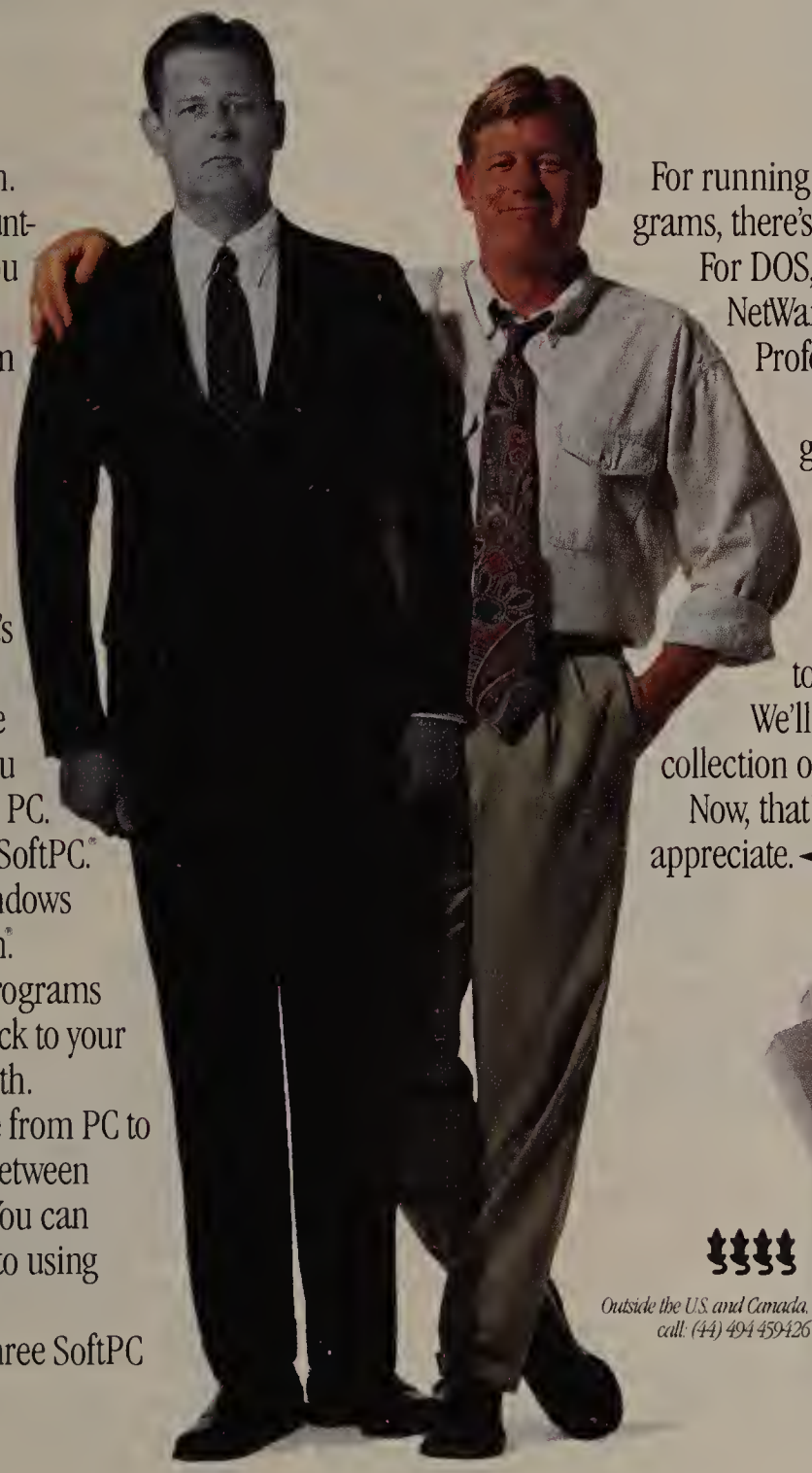

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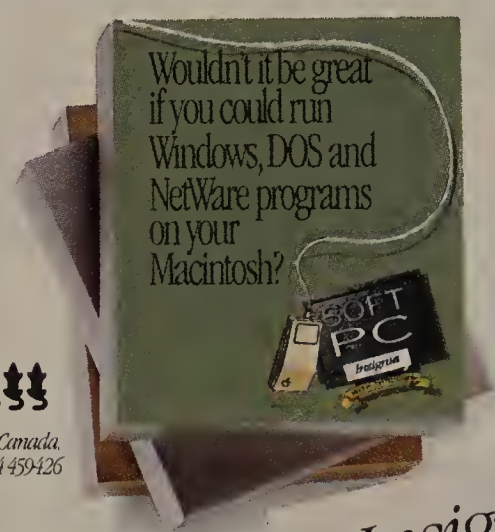

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Actually, Microsoft has done better than that: it's put a tidy front end on the checker. You do your checking and editing right in Word—no separate program is required—and you therefore get to see your document with its original fonts and formatting. Better still, when you run the grammar checker, Word's spelling checker runs simultaneously. Finally, Word's Grammar window is neat, clean, and pretty.

Yes, I *know* that trashing the Grammar module from Word (because of its preposterous disk-space and memory requirements) is an unquestioned reflex of Mac culture gurus everywhere. I'm only suggesting you give it one chance to prove itself first ($495; Microsoft Corporation, 206/882-8080).

Macworld Editor

The grammar programs scored terribly on my Torture Test. Maybe, I thought, I'm holding this software to an impossible standard. Maybe there *is* no hard-and-fast right and wrong. Maybe it's all relative. Maybe my test sentences from *The Elements of Style* are somehow ambiguous and make an unfair test.

To see if a human being could do any better, I submitted the Torture Test to one more grammar checker: one of *Macworld*'s own editors. I gave her the two-page list of sentences, locked her in a room with no books, and asked her to do her darnedest.

Her conception of correct and incorrect matched *The Elements of Style*'s in all but 2 of the 35 passages. Final score: human 33, computer 8.

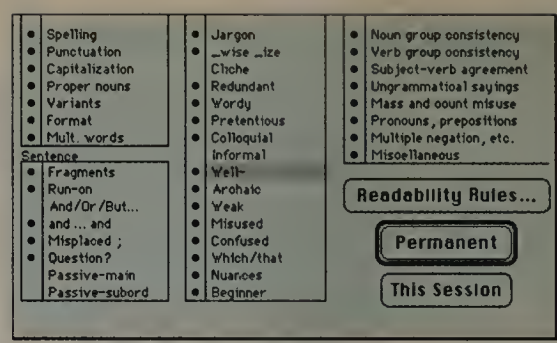
Now, listen. I realize there are 10 million Mac owners, and not every one can afford to hire a crack human checker for every document. But here's a message for the major software companies I mentioned earlier: it's called quality control. Look into it.

The Upshot

Despite the somewhat dismal showing of the stand-alone grammar checkers in my tests, I must hasten to point out that all three come with money-back guarantees.

That said, the worthiest contenders are Word and Correct Grammar, whose comments are right just about as often as they're wrong. And actually, a 50 percent accuracy rating (Word's Grammar command) isn't really so terrible. That's about the success rate I get when running a spelling checker, believe it or not—every other word my spelling checker flags is a person's name or a nonstandard Pogueism. Yet I still check the spelling of every document, and the checker still catches typos my eyes missed.

The stand-alone grammar-checking programs, however, have some growing up to do. Really want a program that improves your writing? Try this: buy *The Elements of Style* and read a chapter every night. Now *there's* a program that works. **m**



Playing by the Rules All grammar software lets you turn off specific kinds of grammatical and stylistic error-checking. Only Word doesn't let you save your preferences as a Style.

DAVID POGUE is author of the novel *Hard Drive* (Berkley Publishing Group, 1993), coauthor of *Macworld Macintosh Secrets* (IDG Books Worldwide, 1993), and winner of the 1977 Ohio Spelling Bee.

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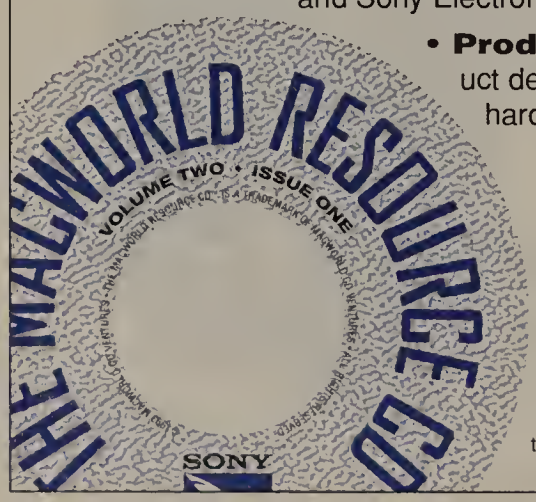

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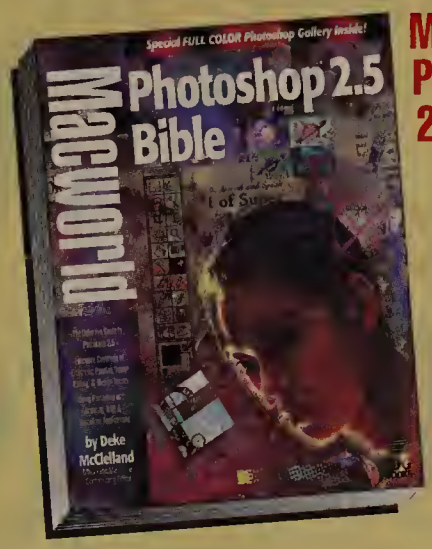

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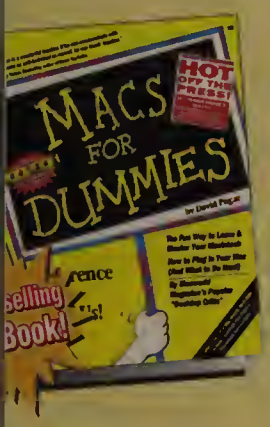

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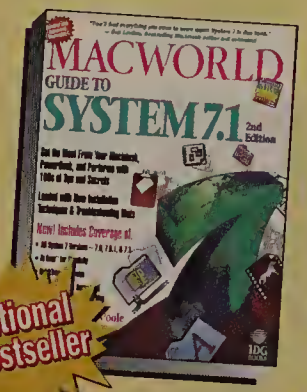

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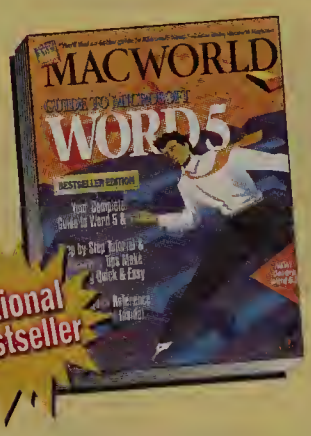

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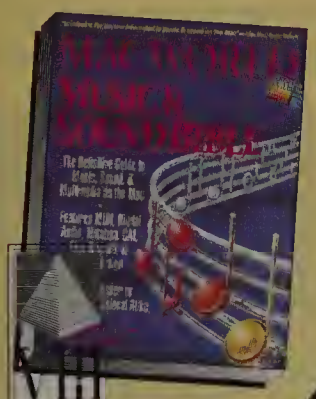

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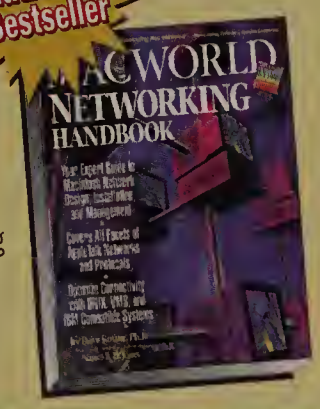

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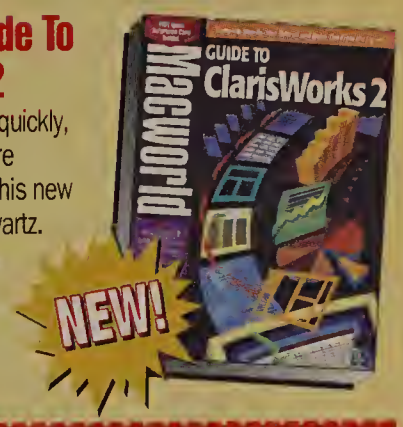

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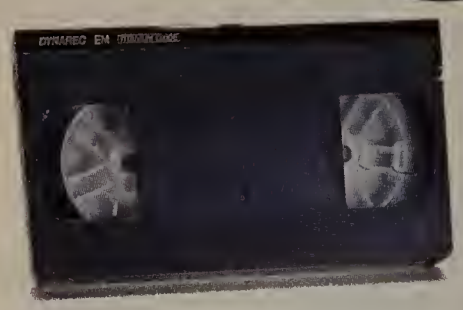

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THE ICONOCLAST

BY STEVEN LEVY

The Truth about CD-ROM

It shines, it shimmers, it's too slow

ONE GORGEOUS DAY IN THE Berkshires, the Bride, the Sprout, and I trekked down an unpaved road. Before us stood a pristine lake, ringed by trees in full bloom. The sun poured down like honey. A cool breeze wafted over the water. For a single golden moment, all was at peace with my world.

And then a little voice popped up inside my head. "You won't really be happy," it said, "until you get a CD-ROM drive."

That voice again! I'd been hearing it now for over a year. I'd hear it when I tried to work. I heard it when conversation flagged at the dinner table. And in postmidnight reveries, when Letterman signed off and thoughts turned to mortality, the voice would return, always whispering the same message: "Make your life complete—buy a CD-ROM drive."

I was tempted to see a shrink until I realized that I was not the only person hearing that voice. In the past couple of years it has targeted its dulcet persuasion on hundreds of thousands of others—normal people like myself who apparently have come to believe that their quality of life depends on spending $400 to $600 for a machine that reads massive quantities of data from shiny discs and displays the results on their computer screens. Apple Computer estimates that this year alone a million Macintosh owners—that's around one in ten—will invest in this technology.

Apple's Personal Interactive Electronics Division has released a sleek new CD-ROM player and is funding development of innovative CD-ROM discs. These will join the ranks of hundreds of CD-ROMs now available for purchase. Many more are on the way, with big entertainment companies like Time Warner and Viacom investing mondo resources in the field.

For years CD-ROM multimedia has been stuck in a chicken-and-egg rut. There weren't enough "titles," as the jargon goes—including entertainment titles and general-audience reference works—to motivate people to buy drives. And potential developers of new titles were discouraged by the puny installed base of drives. But this year, says the smart money, CD-ROM reaches critical mass—the point at which there are enough players to justify producing more titles, which in turn will convince more people to buy players. The voices will get louder and more insistent. And soon we'll have a new era of entertainment, the Age of Interactivity.

At least that's what the voice said. So I caved. I procured a CD-ROM drive, albeit on a temporary basis. After figuring out how to get the drive to work, I sat down with a dozen or so discs and experimented with the future of entertainment. I discovered that some wonderfully talented people have been working in the format, and I saw plenty of innovative uses of sound, graphics, animation, and text retrieval. And when I finally switched off the unit, I had the answer to the question of whether CD-ROM was going to take over the field of entertainment.

To quote the sage Clint Eastwood, "It's not going to happen."

And Now, We Pause

Want to know why? I'll tell you. But first, could you please put down this magazine? That's right, close it up and set it down on the table. Proceed to twiddle your thumbs for about 45 seconds. Now pick up the magazine again. Resume reading for several paragraphs. Stop. Put down the magazine again and count to 30. Grasp the magazine again and read some more.

You find this process annoying, perhaps? Not optimal? Welcome to the world of CD-ROM.

CD-ROM has a Jekyll-and-Hyde personality. On one hand, those rugged little frisbees carry 660MB of information, enough to keep an army of English majors reading until the millennium. On the other hand, by computer standards, the CD-ROM mechanism takes a long time to locate the information and read it from the disc. Most CD-ROM titles are optimized for the lowest-common-denominator players, which have a 150-KBps data-transfer rate, regardless of the speed of your Mac's processor. When a program requires that you send real-time video and audio from a spinning CD through your computer, you run headlong into CD-ROM's limitations.

You should see some of the caveats embedded in the Read Me files. Most of them tell you that if you run the things on anything less than a high-end Mac II with 8MB of RAM, performance will suffer. Many also suggest that you use part of your hard disk to cache some of the data from the CD-ROM drive so performance won't be so slow. Some ask for 18MB or 20MB of space. How many people have 20MB lying fallow on their hard drives?

Also, the demands of attempting to access animations in real time and other strains of the machine are such that a lot of the documentation with CD-ROMs seems to assume that normal use is going to crash your system. Some Read Me files begin by suggesting that you turn off all your system extensions and INITs, and then instruct you on how to revive your system when the inevitable crashes come.

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What the documentation *never* tells you is that you'd better fetch a good book to read so you can pass time profitably instead of staring interminably at the watch cursor while your Macintosh reads and processes information from the disc.

I know that companies, including Apple, are releasing new drives with faster access times (Apple's new portable model is not among them), and there are software programs that speed up some operations. But the problem is really inherent in the technology itself. Band-Aids don't fix it—CD-ROMs are just too slow.

The Experts Speak

Don't take my word for it—listen to a couple of multimedia experts who have broken the silence about CD-ROM's drawbacks.

Denise Caruso is the editor of the *Digital Media*, a newsletter devoted to new media technologies. What does she think of CD-ROM? "It sucks!" she told me. (Denise does not mince words.) "I've been saying this for years—it needs to be fast, and it's just not fast."

With little encouragement she continued. "Hey, I do this stuff for a living," she said. "I have a CD-ROM drive on my desk that I hardly use. [The wait time] is just not worth it."

Critic number two is Marc Canter, the multimedia king who founded MacroMind and has now gathered a so-called Media Band, a digital version of the Monkees, to push interactive entertainment. "Whether it's a game or information, the reason multimedia is so horrible and boring is CD-ROM—it's old technology," he said. "I want to be CD-ROM's number one opponent."

But Marc, I pointed out, aren't you doing your Media Band project on CD-ROM?

"How [else] am I going to stay alive?" he asked, explaining that the interactive media he really wants to produce is five years away. So for now he'll suffer with CD-ROM. But he'll compromise only so far. "Apple wants me to work it on a 4-meg LC III," he said. "Doing what I do in 4 megs'll destroy it—it would constantly be loading segments," he said. "I'll deliver them a version that works on an 8MB Centris. I'll lose half my customers, but the [loading delays] will only take 10 percent of the time, instead of 50 percent."

Canter further explained he's using CD-ROM for the same reason that Hollywood studios and major publishers are dabbling in it—as a testing ground for interactive television. It's all a holding action for the not-too-distant day when the information highway transmits gigabytes of data into our homes, at rates far beyond what the speediest CD-ROM drives can deliver. Until that day, the closest approximation of this new, potentially lucrative form of television are those shiny but slow discs. And when that day does arrive, expect a lot of those CD-ROM players purchased for multimedia entertainment to become doorstops.

Hats Off to Grandma

I don't want to give the impression that CD-ROM is a totally useless technology. When it comes to archiving information, CD-ROMs are wonderful. If you have a recordable CD-ROM drive (which will set you back about $4000), you can put a huge database on a little disc, pop it in a drive, and retrieve any piece of information by a simple search. You can also store an amazing number of images on a single disc. Without CD-ROM technology, Rick Smolan and Robyn Davidson's From Alice to Ocean, a truly impressive project with truly stunning photographs as well as vocal narration and animated maps, could never have been contemplated.

CD-ROM is also ideal for children—at least those who have not been spoiled by the fast response times of video arcade games. I tested some titles on the Sprout (who's three) and was amazed at the degree of attachment he displayed to a CD-ROM in Brøderbund's Living Books series called Just Grandma and Me. By breaking up a children's story into discrete pages and leveraging limited animation for maximum effect, Brøderbund cleverly negotiated the treacherous shoals of CD-ROM's limitations. Just Grandma and Me deserves all the praise it has received.

But when you go beyond kiddieland and look to the more daring examples of multimedia's new wave, you ultimately arrive at something like Hell Cab. This title, like several others, is an interactive graphic novel set in the near future. Its creator, Batman comic artist Pepe Moreno, has imbued the story with arresting graphics, a clever plot, and compelling sound. But the response time is, like the eponymous cab, from hell. The waiting puts a damper on the entire experience. I know it. If you played the game you'd know it. And I think that Pepe Moreno knows it. "CD-ROM," he admitted to me after some initial jousting, "is inherently slow. . . . [It's] a transition medium."

"I think," said Moreno, "the future is interactive cable." I wondered what the mystery voice would say about that. But ever since the CD-ROM drive arrived, I haven't heard a thing. **m**

STEVEN LEVY's new book, *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything,* will be published by Viking in January.

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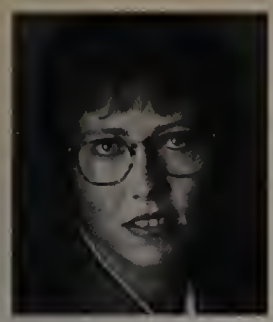

CONSPICUOUS CONSUMER

BY DEBORAH BRANSCUM

Workplace User Groups Offer Support

Getting started is rewarding, if not always easy

THE FEDERAL EXPRESS PC User's Group was started because employees couldn't get computer education on the job and the company's few gurus were being swamped with calls. Mac-minded folks at the Walt Disney Company began a Mac user group to keep up on the technology. A single employee at Domino's Pizza spearheaded a MUG there after needing a project he was doing on a Mac.

User groups have always been a terrific source of information for Macintosh users, so it's not surprising that all sorts of companies, colleges, and government agencies support workplace MUGs. Of the 1912 registered MUGs in the United States, more than 750 are workplace or university related.

One notable example is the Pentagon Macintosh User Group of Washington, D.C., established in late 1985 and flourishing ever since. Army Major Stephen Broughall helped form the group, whose membership ranges between 200 and 250. Broughall cites several personal benefits from his involvement with PMUG, including "meeting people from across the spectrum of the Defense Department who have a common interest in Mac technology, being on top of industry news, and meeting notable individuals."

The Defense Department also benefits from a free, unofficial Mac-help–desk network, according to Broughall. "In fact, some of our more expert members often get queries from industry, including Apple, on technical subjects." The department has even called on PMUG for more specific duties. "During Operation Desert Shield, PMUG volunteers worked over a weekend to configure a load of Mac Portables bound for Saudi Arabia and a priority mission," says Broughall. "Apple, Falcon Microsystems, Claris, and FedSoft provided products in response to an urgent Defense Department request, and PMUG assumed responsibility for configuration. It worked out superbly."

The KTVU Macintosh Users Group of Oakland, California, is far smaller and newer than PMUG, but its members share the same motivation—to learn more about using the Mac in their workplace. Television station KTVU uses about 50 Macs for administration, publication design, audio editing, and as a satellite controller, according to Bob Hirschfeld, director of administration. Despite its youth and infrequent meetings, the year-old MUG has been helpful to its 20 members.

"An employer user group brings people from diverse parts of the business together in a way that isn't just work re-

lated," notes TV consumer editor Tom Vacar. "I've talked to people now in this building that I normally wouldn't have much conversation with, because of the MUG—it ups a certain degree of employee communication."

Vina Cera, who operates a character generator for KTVU, likes the direct access to software programs and developers that MUGs can provide. And problem solving is a drawing card, too; TV director Bob Adams tracked down the source of his modem problems at one meeting.

Starting a User Group

Apple Computer created the User Group Connection in 1985 to assist user groups. This division, which may become independent, supports user groups by providing a start-up kit to newly registered groups; sending monthly mailings of information about Apple products and programs; and publishing the *QuickConnect* newsletter, which has articles that local MUG newsletters can reprint.

While Apple is often the main resource for MUGs, Microsoft and other companies are hip to the importance of these organizations. These days many developers offer information, discounted software, and special programs for MUGs. Even so, starting a group is no small endeavor; before you begin, consider whether an existing MUG might not meet your needs.

MacSciTec and MacIS, for example, are two MUGs for different sets of professionals. MacSciTech (508/755-5242) is an independent association of more than 1500 scientists and engineers. Members gather annually to exchange papers and hear presentations on the use of the Mac in technical applications. MacIS, Managing Apple Computers in Information Systems (513/398-7500), is largely a group of Fortune 500 companies. The 400 members are mostly information system managers who oversee large Macintosh installations and who wanted to share experiences and approaches to the Macintosh, according to William F. Monteith, executive director of the Mason, Ohio–based group. At the time, "Apple was more used to dealing with individuals than large corporations," says Monteith; MacIS was designed to make sure Apple

continues

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hears what large Macintosh sites need.

Members vote annually on the top issues for Apple consideration. Last May, for example, the top ten included requests that Apple deliver on its stated support strategy; unify and enhance network and hardware security; and communicate its PowerPC strategy. MacIS also asked Apple to acknowledge and track operating-system bugs and to improve AppleTalk Remote Access.

Standing MacIS task forces work with Apple managers to resolve issues, which are then removed from the list. Working directly with Apple is "the number one reason that large corporations join MacIS," says Monteith. Members "have a vote and they have a way to influence Apple with their product needs and requirements." Monteith says the group's conferences are a great forum for reaching both Apple and Microsoft.

The group meets twice yearly; this fall's conference is slated for November 7 to 11 in Orlando, Florida. Most members are IS managers at companies with an average of 3250 Macs (though some, like Procter & Gamble, have more like 20,000). Membership is $500 per person; companies that are not Macintosh product developers must have more than 100 Macs to join. Call 513/398-7500 for more information.

Before you launch a user group, call Apple at 800/538-9696, extension 500, and ask if there is a professional organization that covers your area of interest, or a nearby community group. If there are none, request a copy of *Just Add Water, Workplace Edition.* This free 96-page booklet covers the ins and outs of starting and sustaining a successful workplace group and is must-read material for anyone who wants to set up a company MUG. (Another version targets community-based MUGs.)

Decisions, Decisions

Just Add Water outlines several important issues any workplace MUG must confront:

• Does your workplace need a MUG? A crackerjack MIS department or tech-support team may make a company MUG unnecessary.

• How much company support do you want? A strictly recreational MUG may be wild for Spectre or Super Maze Wars. But if the group meets during office hours or is financed by the company, it may be impolitic to spend time on games.

• Will you charge dues? If so, the group must establish systems for tracking finances, obeying tax laws, and staying financially healthy. If not, some other form of funding or support from your company will be necessary to launch the group.

To get started, a workplace MUG needs to determine its goals, establish a base of volunteers, and begin holding regular meetings. The biggest problem for many MUGs is recruiting and retaining members. *Just Add Water* offers several successful tactics. Of course you can use E-mail to get the word out, but other approaches may help. Give fliers to your MIS department or tech-support group to pass out to Macintosh users. One MUG leader evangelized his group by sending out information on a disk to all full-time faculty members at his university.

Everybody Benefits

The range of benefits and services offered by workplace MUGs depends on their size, resources, and the support employers offer. For example, the Federal Express MUG recommends hardware and software purchases for particular applications. The Walt Disney Company MUG operates a company bulletin board system for sharing files and information needed by many departments. Other workplace MUGs collect and distribute company-developed templates and macros to help increase productivity.

Successful workplace MUGs benefit everyone: employers get more knowledgeable and productive Macintosh users, and employees get answers to their questions. **m**

SERVICE HERO

Jonathan Jacobs of Cleveland writes to commend Symantec in general and employee Tom Emerson in particular for recent tech-support efforts. Jacobs called for help with problems he was experiencing with Think C. He writes that "Tom Emerson took the time to walk through some of my code, finding some really picky errors that caused the most amazing explosions. After finding the problems, Tom was able to spend almost half an hour with me, correcting some misunderstandings I had, and later sent me some sample code to illustrate the points he had made."

Send nominees for sainthood to *Service Heroes, Macworld,* 501 Second St., San Francisco, CA 94107, or via AppleLink (Macworld1) or America Online (Branscum). Conversely, drop *Conspicuous Consumer* a line if a company is ignoring you.

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MACWORLD
POSITIO

DECISIONS ARE EASIER ONCE

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MACWORLD EXPO/SAN FRANCISCO

WEDNESDAY, JAN. 5 - SATURDAY, JAN. 8, 1994

SPEND A LITTLE TIME IN THE FUTURE

You know what you want. You know where you're going. But what's the best way to get there? How can your Macintosh platform help you achieve your goals? As the global source for Macintosh information, MACWORLD Expo is your single, best resource to get answers to these questions and more. With over 500 exhibiting companies presenting the very latest in Macintosh technology, MACWORLD Expo shows how you can get from "here" to "there." At MACWORLD Expo you can: Decide whether it's better to upgrade your system or buy new. See which model is best for you. Decide if you should buy now or buy later. Take a look at what's new in software. See what's out there to increase your productivity. And preview what will hit the market soon.

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MACWORLD Expo offers you the opportunity to make side-by-side comparisons of thousands of Macintosh hardware, software, peripheral and service products. And with an army of Macintosh professionals on hand to answer your questions, decision-making is easy at MACWORLD Expo. MACWORLD Expo shows you new ways to turn your vision into reality. A visit to MACWORLD Expo is like spending a little time in the future.

MACWORLD EXPO/SAN FRANCISCO 1994 JAN. 5 - JAN. 8

MACWORLD Expo/San Francisco 1994 will cover 400,000 square feet of exhibit space at San Francisco's Moscone Convention Center. When you come to MACWORLD Expo/San Francisco, you'll see uses and applications for the Mac in areas that include: Networking, Spreadsheet Analysis, Databases, Education, Research, Word Processing, Accounting, Law, CAD/CAM, Forecasting, Design, Publishing, Illustration, Animation, Music, Programming, Entertainment and Multimedia. With so much to see, this decision is easy: plan to be in San Francisco from January 5 - January 8 to experience the Macintosh at its absolute best!

PREREGISTRATION SAVINGS ARE AVAILABLE NOW

Now is the time to pre-register for MACWORLD Expo/San Francisco! When you return the attached pre-registration form with your payment by December 1, you'll save $30 on all Conference Sessions* and Exhibits ($120 now vs. $150 at the door), or $15 on Exhibits-only admission ($25 now vs. $40 *cash only* at the door). Pre-registration not only saves you money, it also saves you time. When you pre-register, we send your admission badge early so you can walk right into MACWORLD Expo and get a jump on the thousands of people expected at the show!

SPECIAL EXPO OFFER: 6 ISSUES OF MACWORLD MAGAZINE

Your registration fee for MACWORLD Expo/San Francisco includes a six-issue subscription to *Macworld* magazine. To receive your six issues, simply fill out the Special Expo Card at the *Macworld* booth during the show. Your first issue of *Macworld* magazine will be mailed to you soon after the conclusion of MACWORLD Expo.

A CLEAR VIEW OF TOMORROW

The Conference Program

As your computer capabilities grow stronger, more powerful, and more sophisticated, your Macintosh is rising to the occasion. But you need to know more. You need to get an overview of what Mac technology can do today, and you need to know how you can slash costs, increase productivity, maximize your efforts, and even have fun in the process. You also need to know what the future will be for Macintosh computing. What's new and exciting in Macintosh technology? What's in store for tomorrow? What new directions is Apple taking and how will you be affected?

The MACWORLD Expo Conference Program takes a close look at all these issues and delivers answers you'll love to hear. You'll learn exactly how much you can achieve with your Macintosh now, and what's on the horizon. The Conference faculty offers you a clear view of tomorrow in 14 complete conference programs with over 140 individual sessions. MACWORLD Expo's one-price conference admission policy lets you create your own customized agenda. Spend as much time as you'd like at any or all of these conference sessions:

1. The Design Conference. Some of the most respected names in Macintosh design share insights and demonstrate breakthroughs in pushing the desktop envelope with: creative imaging; prepress; digital photography; interactive publishing; high-quality color input/output; 3-D modeling and rendering; new media; and more. Plus: power-user tips on maximizing Photoshop, LivePicture, Acrobat, and other key designer tools.

2. The Entertainment Conference. Top industry designers, post-production houses, directors, producers, animators, and other leading-edge users discuss the Mac's use in television, film and commercial applications. Featured here will be: professional video, digital audio, broadcast-quality graphics, animation, virtual reality, digital video effects, music, sound, and more.

3. Apple's New Horizons Conference. From consumer electronics products (such as the Newton MessagePad) to breathtaking sources of expanded computer power (such as the PowerPC and the multimedia Macs), Apple is blazing new trails that will have far-reaching implications. These sessions will explore significant new industry trends that will have the biggest impact on Apple's customers.

4. The Enterprise Computing Conference. Providing the right information, to the right person, at the right time, to make the best decision. Enterprise-wide information delivery. Client/server problems and opportunities. Thorny Mac/IS issues. Downsizing/rightsizing. Open systems. New communications tools and technologies.

5. The Connectivity Conference. Insights on what lies ahead in Macintosh connectivity, plus hard-hitting how-to's on surviving and prospering with what's here and now. Includes: moving info between multiple platforms; connecting users in remote locations; essential network management tools; TCP/IP; AOCE; Mac/PC integration on a LAN; and more.

6. The Home Office/Small Business Conference. How to reduce the chaos and maximize your efforts in a Mac home/small business, along with a look at hardware and software especially designed to save you time and money, low-cost and no-cost programs and procedures, users' favorite utilities and shortcuts, and disaster-avoidance strategies.

7. The Science/Technology Conference. The Mac as a critical research tool, in scientific applications, management of technical data, the future of CADD, visualization techniques using QuickTime, telerobotics, and other outstanding applications of the Macintosh in laboratory and scientific settings.

8. The How-to-Get-Started Conference. Complete guidelines for those who are brand-new to the Mac, or need a concentrated lesson on popular Mac applications, including desktop publishing, databases, accounting, HyperCard, telecommunications, programming, design, multimedia, and QuickTime (to name but a few).

9. The Education Conference. Both new and classic examples of the Mac as an incomparable teaching tool – in elementary education; in secondary education; and at the university level. Included will be: multimedia, desktop publishing, CD-ROM, HyperCard, networking, QuickTime, BBSs, Internet — plus educator success stories with the Mac in math, science, language arts, and social studies.

10. The Advanced User Conference. Experienced users share their expertise and insider's tricks for squeezing absolutely the most productivity out of the PowerBook, desktop publishing, System 7's power user features, customizing your Mac, resolving system conflicts, and hot new ideas and insider's tricks galore.

11. The Special Interest Group Conference. For "birds of a feather" looking to compare Mac notes with others in a similar setting — to solve special problems, to see how colleagues across the country are getting more mileage out of the Mac, and to develop an invaluable "user network." Here you'll find sessions on the Mac in the law office, in health care, in real estate, in government, and the Mac for senior citizens.

12. Application Workshops. Intensive training sessions, by the award-winning staff of MacAcademy, on such popular applications as: Claris FileMaker Pro; Microsoft Word; Aldus PageMaker; Microsoft Excel.

13. The You-Asked-for-It Conference. Fact-filled sessions covering latest market developments and emerging technologies, and responding to your special requests — including the perennial favorite MUSE (MACWORLD Expo User Group Extravaganza).

14. The Multimedia Conference. More than 20 multimedia sessions will dazzle and delight attendees with: • real-world experiences of multimedia users fresh from the trenches • popular-demand topics on creating exceptional-quality productions and presentations with both high-end and low-end multimedia tools • state-of-the-art reports from the industry's leading vendors on the most exciting new developments in the hottest multimedia technologies • an invaluable treasury of how-to tips, insights, and guidelines • how users are applying multimedia technologies to deliver the most powerful message possible to a target audience.

PREREGISTER FOR MACWORLD EXPO/SAN FRANCISCO BY DECEMBER 1 AND SAVE $15 TO $30

Please choose your package and fill out the form completely. Incomplete forms will be returned. **One form per person; make photocopies for additional people.** Please do not staple check to form. Registration forms received after December 1 will be returned unprocessed. PURCHASE ORDERS CANNOT BE ACCEPTED. ALL REGISTRATION FEES ARE NONREFUNDABLE. A $20 fee will be charged for all returned checks.

Send completed forms to:

MACWORLD Expo/San Francisco
P.O. Box 4010
Dedham, MA 02027

U.S. Attendees: Badges will be mailed on or about December 20. Be sure to check box indicating where badge should be sent.

International Attendees (including Canadian): Badges will be held for pick-up at the International Pre-registration counter at Moscone Center. International badge pick-up hours are January 4-8, 10am to 6pm. For Federal Express service, check the appropriate box below and add $45 to your preregistration fee. Fill in your exact street address (no P.O. boxes) and include your telephone number and country code. We will Federal Express your badge directly to you.

SPECIAL EXPO OFFER
6 Issues of *Macworld* magazine: Your registration fee to MACWORLD Expo/ San Francisco will include a six-issue subscription to *Macworld* magazine. To receive your six issues, simply fill out the Special Expo Card at one of the Macworld booths during the show. Your first issue of *Macworld* magazine will be mailed to you soon after the conclusion of MACWORLD Expo.

Please register me for:

☐ **Package One $120**
Conference sessions* and exhibits. Pre-register by December 1 ($150 at the door).

☐ **Package Two $25**
Admission to exhibits only. Pre-register by December 1 ($40 ***cash only*** at the door).

☐ **Check if applicable.** I'm an International attendee and would like my badge shipped by Federal Express. Enclosed is an additional $45.

Please send my registration badge and further information to:

Please check one: ☐ Home Address ☐ Company Address

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If mailing to company address: *(If mailing to your home address, leave the next two lines blank.)*

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After December 1, you must register at the show.

Please check the appropriate information:

Your industry or profession (choose one only)

01.☐ Accounting/Finance
02.☐ Art/Design/Creative Services
03.☐ Arts & Entertainment
04.☐ Communications/Publishing
05.☐ Computer Reseller/VAR/VAD
06.☐ Consulting
07.☐ Corporate/General Management
08.☐ Distributor/Dealer/Retailer/Service
09.☐ Engineering/R&D
10.☐ Government
11.☐ Health Services
12.☐ Higher Education
13.☐ K-12 Education
14.☐ Legal Services
15.☐ Manufacturer (computer industry)
16.☐ Manufacturer (non-computer)
17.☐ Marketing/Sales/PR/Communications
18.☐ Other _____

Your title (choose one only)

19.☐ CEO/President/VP
20.☐ DP/MIS Manager
21.☐ Manager/Department Head
22.☐ Network Manager
23.☐ Programmer/Analyst
24.☐ Engineer/R&D
25.☐ Consultant
26.☐ Marketing/Sales
27.☐ Educator
28.☐ Art Director/Graphics
29.☐ Editor/Writer
30.☐ R&D
31.☐ Student
32.☐ Other _____

Size of your organization (number of employees national and international)

33.☐ Under 50
34.☐ 50-99
35.☐ 100-499
36.☐ 500-999
37.☐ 1,000 & over

Which personal computer(s) do you own/use?

38.☐ Apple Workgroup Servers, Mac Quadra Series, Mac Centris Series, Mac II Series
39.☐ Mac Performa Series
40.☐ Mac LC Series
41.☐ Mac PowerBook-series, Duo-series
42.☐ IBM PC (or compatible)
43.☐ None
44.☐ Other _____

Which hotel are you staying at?

45.☐ _____
_____

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CHOOSE THE WAY TO COMPLETE YOUR STAY

MACWORLD Expo/San Francisco 1994, Wednesday, January 5 - Saturday, January 8, 1994 at Moscone Convention Center, 747 Howard Street.

Show Hours	Conference Hours
10 a.m. – 6 p.m. daily	10:30 a.m. – 6 p.m. daily

Deciding to go isn't the only easy part about MACWORLD Expo/San Francisco 1994. We're pleased to offer a complete package of discounts and amenities that also make MACWORLD Expo/San Francisco decidedly easy to attend:

Fly American Airlines and Save. Receive savings on applicable fares when you fly American Airlines to MACWORLD Expo/San Francisco. As the official airline of MACWORLD Expo, American is offering additional discounts of 5-10% on most fares. To see if American Airlines can offer savings to you, dial 1-800-433-1790 and ask for Star File #S-0114AL.
Savings are available on applicable fares only.

Car Rental Discounts From Hertz. If you're planning to rent a car, you'll get a great rate from Hertz. Call 1-800-654-2240, ask for Convention #2429, and tell the reservations operator you're attending MACWORLD Expo.

Take the Shuttle and Enjoy the Free Ride. Complimentary shuttle service is available from the Cow Palace and Cal Train. Look for specifics in your pre-registration package. Moscone Center is accessible from 80 East, 4th Street Exit; from the Bay Bridge, Fremont Street Exit; and from Golden Gate, Lombard Street Exit. Call 415-974-4000 for detailed directions.

Services for the Physically Challenged. Services are available to help make the MACWORLD Expo experience more enjoyable for the physically challenged. Call us at 1-800-945-3313 for details.

Prerecorded Information. To listen to pre-recorded information about MACWORLD Expo/San Francisco 1994, call the MACWORLD Expo Information Hotline at 617-361-3941. (24 hours a day, seven days a week.)

Early Bird Registration. If you miss the pre-registration deadline of December 1, you can still register before the start of the show! On-site Early Bird Registration is from 10 a.m. – 6 p.m. on January 4, at the full registration rates of $150 for all Conference Sessions* and Exhibits, and $40 (***cash only*** at the door) for Exhibits-only admission.

Hotel Accommodations. Participating hotels in the San Francisco area are offering MACWORLD Expo discounts. To receive the preferred rates, simply call one of the hotels listed and mention you're going to MACWORLD Expo. There's a limited number of rooms available at preferred rates, and they sell out rapidly. *Please make your reservation by December 2 for the best selections. If you are reserving ten or more rooms, you must supply the hotel with the first night's non-refundable deposit and a rooming list no later than November 18th.*

**MACWORLD Expo Conference sessions are on a first-come, first-served basis with no guaranteed seating, and are subject to change without notice.*

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Hotels

Please note: published hotel rates are starting rates and are priced for single and double occupancy. All hotel phone numbers are in the 415 area code.

ANA Hotel: $149/$165
50 Third Street, 974-6400

Fairmont Hotel: $99/$99
Atop Nob Hill, 772-5000

Four Seasons Clift Hotel; $145/$155
495 Geary Street at Taylor, 775-4700

Grand Hyatt San Francisco; $139/$139
345 Stockton Street, 398-1234

Holiday Inn Civic Center; $99/$114
50 Eighth Street, 626-6103

Holiday Inn Golden Gateway: $80/$90
1500 Van Ness Avenue, 441-4000

Holiday Inn Union Square; $117/$137
480 Sutter Street, 398-8900

Hyatt Regency San Francisco; $140/$160
5 Embarcadero Center, 788-1234

King George Hotel; $97/$107
334 Mason Street, 781-5050

Hotel Nikko; $138/$154
222 Mason Street, 394-1111

Orchard Hotel; $85/$85
562 Sutter Street, 433-4434

Parc Fifty-Five; $140/$155
55 Cyril Magnin Street, 392-8000

Ramada Hotel at Fisherman's Wharf: $85/$85
590 Bay Street, 885-4700

Ritz Carlton San Francisco; $150/$170
600 Stockton at California Street, 296-7465

San Francisco Hilton: $145/$165
333 O'Farrell/On Hilton Square, 771-1400

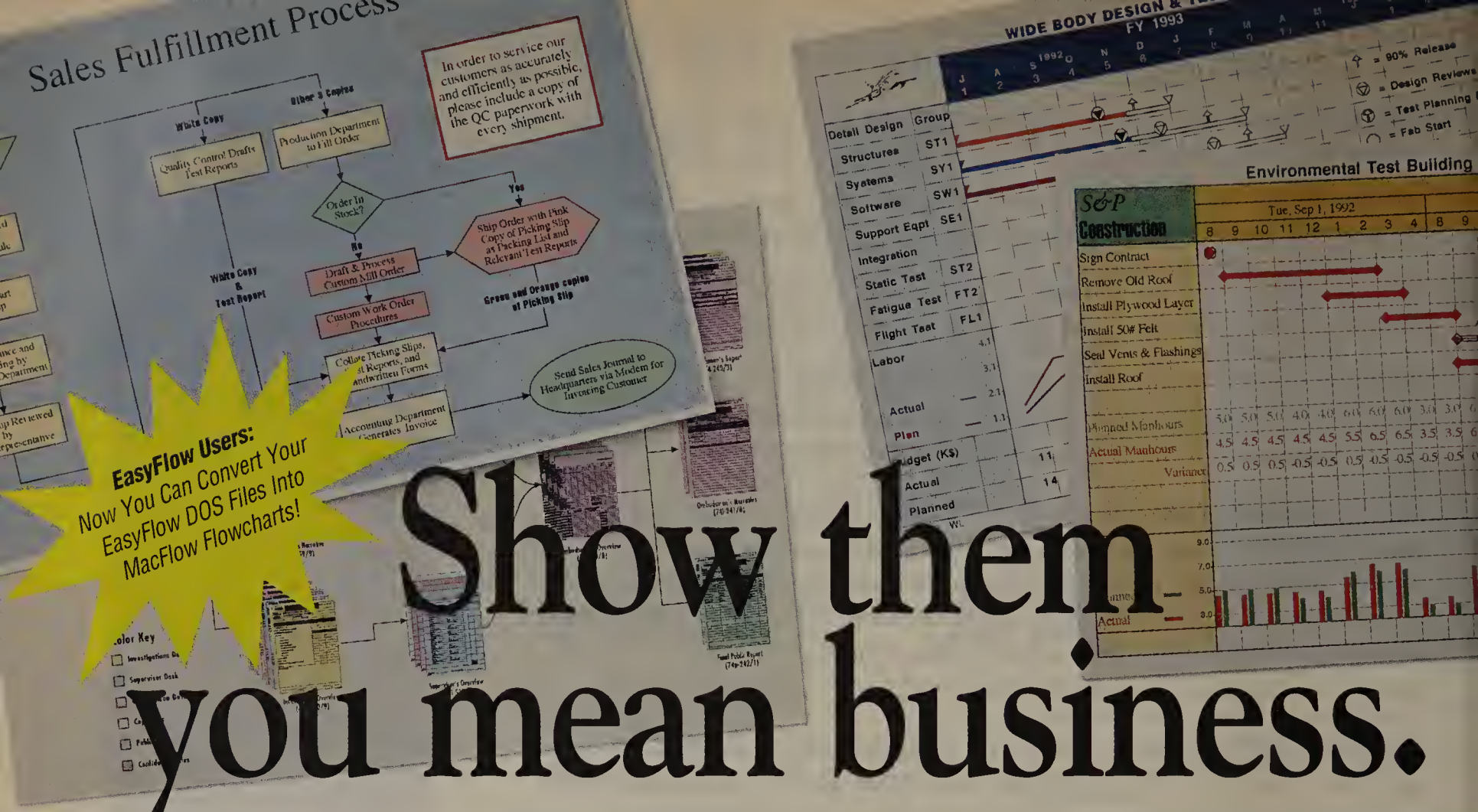
San Francisco Marriott; $164, $184
55 Fourth Street, 896-1600

Sheraton Palace Hotel: $150/$170
2 New Montgomery Street, 546-5000

Sir Francis Drake Hotel; $100/$100
450 Powell Street, 392-7755

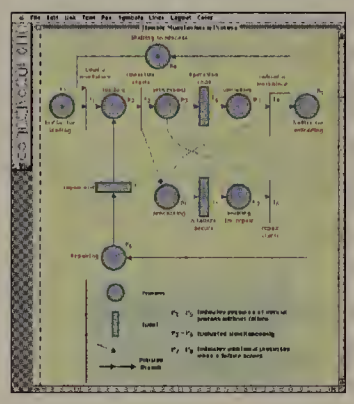
Stouffer Stanford Court Hotel; $135/$155
Nob Hill, 989-3500

The Westin St. Francis: $140/$160
335 Powell Street, 397-7000



Show them you mean business.

MacFlow 3.7
Flowchart Design and Development



Lay it all out for them—the process, the procedures, the relationships. Business works best when everything is clear, and there is no better way to make things clear than a detailed flowchart.

The best way to create flowcharts is MacFlow—the highest-rated flowcharting program. Neither drawing programs nor pencil and paper can create flowcharts as easily as MacFlow. And no program is simpler to learn or use. Graphically organize complex processes, projects, and structures—minutes after opening the package.

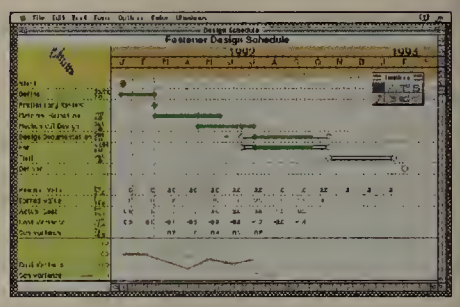
Simply drag pre-drawn symbols onto a page and connect with curved or straight lines. Place text in symbols and on lines, as well as in freestanding notes. Change the chart as desired; lines stretch and stay attached to symbols. Even create stand-alone flowcharts that can be freely distributed to any Macintosh user (and any Windows user with an optional viewer). MacFlow is also System 7-savvy, letting you publish your charts and subscribe to text. Translate to and from text in ASCII and RTF formats as well as outlines created in Acta 7 and MORE.

MacFlow actually enhances your thought process because the interface is so simple and intuitive, nothing stands between your ideas and a presentation-quality flowchart. In fact, you'll find just creating flowcharts keeps your thoughts organized and helps you get a handle on any task.

Show them you're serious—get MacFlow today.

MacUser Magazine July '91

MacSchedule 3.0
Project Planning and Tracking



Lay it all out for them—the plan, the people, the cost. Give them a path to follow and a way to track progress. Successful projects need a roadmap, and nothing can beat a simple yet comprehensive project schedule.

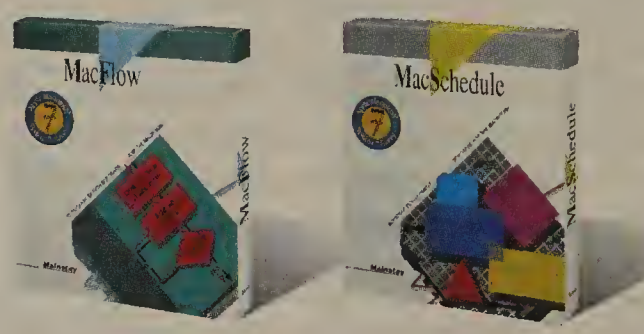
The best way to create quick, presentation-quality project schedules is MacSchedule. The Gantt-chart interface lets you create schedules, with integrated financial data, minutes after you open the application—unlike complex project management software. And MacSchedule is as easy to learn as it is to use.

MacSchedule automatically creates and manages a project calendar. Just enter task names, then indicate timing with a click and drag of the mouse. Status tracking is also easy—just click on a task bar to show progress.

MacSchedule helps track a project from initial estimates to current status by automatically developing calendarized cost estimates and reporting cost and schedule variances in an Earned Value summary. MacSchedule is also System 7-savvy, letting you publish your schedules and data as well as subscribe to data from other programs. Place schedules in documents for proposals and reports or print schedules as slides, overheads, or wallcharts.

With MacSchedule's graphic feedback, you can tell at a glance where your project is and where it's headed. It's the perfect tool for any manager.

Show them your plans for success—get MacSchedule today.



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Circle 5 on reader service card

Editors' Choice

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Susan Grant-Marsh

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in *Macworld*'s comparative articles through the past year. A ✣ next to a product indicates that we chose more than one product in that category.

Hardware

MONITORS

BLACK-AND-WHITE MONITORS, May 93
Portrait monitor: 15-Inch Gray Scale Portrait Display; Mirror Technologies, 612/633-4450; $399, with video-display board $549.
Two-page monitor: ✣ L-View MultiMode; Sigma Designs, 510/770-0100; $1099, with video-display board $1398. ✣ MD 202 Two Page Display; Mobius Technologies, 510/654-0556; $699, with video-display board $798.

COLOR MONITORS, Oct 93
16- and 17-inch: ✣ ErgoView 17; Sigma Designs, 510/770-0100; $1349. ✣ MultiSync 5FG; NEC Technologies, 708/860-9500; $1355 (NEC's estimated dealer price).

GRAY-SCALE MONITORS, May 93
Portrait monitor: Pivot Display; Radius, 408/434-1010; $849, with video-display board $1148.
Two-page monitor: MultiMode 120, SilverView Pro; Sigma Designs, 510/770-0100; $1099, with video-display board $1299.

NETWORK HARDWARE

HARDWARE ROUTERS, Jul 93
Under $1500: EtherRoute; Compatible Systems, 303/444-9532; base model $1495 (no TCP/IP support).
Between $1500 and $3500: InterRoute/5; Farallon Computing, 510/814-5000; $3299 to $3499.

HIGH-SPEED FAX MODEMS, Oct 93
Teleport Gold and Silver with Global Fax; Global Village Communication, 415/390-8200; Gold $499, Silver $429.

POWERBOOK TOOLS

DUO DOCKING CONNECTORS, Feb 93
PowerLink DeskNet; E-Machines, 503/646-6699; $699.

EXTERNAL HARD DRIVES, Feb 93
✣ Companion 120; APS Technologies, 816/478-8300; $599. ✣ PocketDrive 120MB; La Cie, 503/520-9000; $699.

INTERNAL FAX MODEMS, Feb 93
✣ PowerModem series; PSI, 408/559-8544; $195 to $495. ✣ PowerPort series; Global Village Communication, 415/390-8200; $229 to $499.

SCSI MONOCHROME MONITORS, Feb 93
Power Portrait; Sigma Designs, 510/770-0100; $749.

PRINTERS

COLOR PRINTERS, May 93
Dye-sublimation: ✣ ColorStream/DS; Mitsubishi International, 408/980-1100; $9950. ✣ Phaser IISD Color Printer; Tektronix, 503/682-7377; $9995.
Thermal-wax: ✣ ColorScript 210; QMS, 205/633-4300; $4995. ✣ Personal ColorPoint PSE; Seiko Instruments, 408/922-5800; $2999.
Low-end liquid-ink: HP DeskWriter 550C; Hewlett-Packard, 800/752-0900; $1099.
Midrange liquid-ink: HP PaintJet XL300; Hewlett-Packard, 800/752-0900; $3495.
Solid-ink: Phaser III PXi Color Printer; Tektronix, 503/685-3585; $9995.

PERSONAL PRINTERS, Sep 93
Ink-jet: StyleWriter II; Apple Computer, 408/996-1010; $359.
PostScript laser: TI microLaser Series; Texas Instruments, 512/250-6679; $1199 to $1599.
QuickDraw laser: LaserWriter Select 300; Apple Computer, 408/996-1010; $839.

WORKGROUP PRINTERS, Jan 93
Basic printing: microLaser XL Turbo; Texas Instruments, 512/250-6679; $3649.
High-speed office printing: Pagemarq 20; Compaq Computer Corp., 713/370-0670; $5699.
Duplex printing: LaserJet IIISi; Hewlett-Packard, 800/752-0900; $6995.

SCANNERS

LOW-COST COLOR SCANNERS, Nov 93
$1300–$1600: ✣ La Cie Silverscanner II; La Cie, 503/520-9000; $1599. ✣ Hewlett-Packard ScanJet IIc; Hewlett-Packard, 208/323-2551; $1599.
Under $1300: Mirror 800 Plus Color Scanner; Mirror Technologies, 612/633-4550; $1299.

OCR, Nov 93
OmniPage Professional; Caere Corporation, 408/395-7000; $995.

SYSTEMS/STORAGE

CD-ROM DRIVES, Oct 92
High-performance: InterSect CDR-74; NEC Technologies, 708/860-9500; $712.
Budget choice: Mirror CD-ROM Drive; Mirror Technologies, 612/633-4450; $599.

DOUBLE-SPEED CD-ROM DRIVES, Jul 93
Sheer speed: Pioneer DRM-604X; Pioneer, 408/988-1702; $1795.
Overall value: AppleCD 300; Apple Computer, 408/996-1010; $599.
Budget choice: NEC MultiSpin 38; NEC Technologies, 708/860-9500; $465.

HIGH-SPEED HARD DRIVES, Aug 93
1GB drives: ✣ Edge 1000r; Saturae, 617/661-8166; $1499 ✣ MiniPak 1000; Optima Technology, 714/476-0515; $1995.
2.7GB drives: ✣ Nova XL 2700; Microtech International, 203/468-6223; $6289. ✣ Vista 3.5GB; Relax Technology, 510/471-6112; $3499.
SCSI-2 adapter: QuickSCSI; PLI, 510/657-2211; $499.

MIDRANGE HARD DRIVES, Mar 93
Low-capacity drive: La Cie Cirrus 240; La Cie, 503/520-9000; $769.
Notable technology: DiamondDrive 510; Mass Microsystems, 408/522-1200; $2089.
Bargain: APS Fujitsu 520; APS Technologies, 816/478-8300; $1149.
All-around quality: hammer 525FMF; FWB, 415/474-8055; $2799.

MACINTOSH UPGRADES, Jun 93
Classic accelerator (40MHz): TransWarp Classic; Applied Engineering, 214/241-6060; $798 (with FPU).
SE accelerator (50MHz): Gemini Integra; Total Systems, 503/345-7395; $1089 (with FPU).
SE accelerator (25MHz): Quik30; Novy Systems, 904/427-2358; $449 (without FPU).
SE/30 accelerator (50MHz or 33MHz): Universal PowerCache; DayStar Digital, 404/967-2077; 50MHz $999 (with FPU), 33MHz $449 (without FPU).
LC and LC II upgrades: Macintosh LC III Logic Board Upgrade; Apple Computer, 408/996-1010; $599.
Mac II accelerators: ✣ Radius Rocket 25i, Radius Rocket 33; Radius, 408/434-1010; 25i $1199, 33 $2499. ✣ DayStar Digital Universal PowerCache series; DayStar Digital, 404/967-2077; $449 to $999.
IIfx SCSI accelerator: QuickSCSI; PLI, 510/657-2211; $499.

continues

MACWORLD Editors' Choice

Quadra static-RAM cache card: FastCache Quadra; DayStar Digital, 404/967-2077; $299 for Quadra 700 and 900, $449 for Quadra 800 and 950.

OPTICAL DRIVES, Nov 92
3½-inch (128MB): ✣ Magic 128 REM/MO; MacProducts USA, 512/476-5295; $1199. ✣ NuDesign; MacDirect, 612/832-5706; $1298.
5¼-inch (650MB): PMO-650; Pinnacle, 714/727-3300; $4198.

REMOVABLE DRIVES, Nov 92
SyQuest drives: SyQuest drives are the best choice among removable drives for most users, but individual products are too similar for us to single out a specific vendor.

TAPE DRIVES, Dec 92
Personal Backup (up to 150 MB): APS Teac 155; APS Technologies, 816/478-8300; $499.
Midrange backup (150MB to 600MB): ✣ hammerTape 525; FWB, 415/474-8055; $1469. ✣ Vista 600 Tape; Relax Technology, 510/471-6112; $779.
High-capacity backup (1GB and beyond): APS Compression DAT; APS Technologies, 816/478-8300; $1699.

VIDEO/DISPLAY

24-BIT COLOR GRAPHICS BOARD, Feb 93
✣ Spectrum/24 PDQ Plus; SuperMac Technology, 408/541-6100; $1999. ✣ Thunder/24; SuperMac Technology, 408/245-2202; $2999.

COLOR LCD PROJECTION, Jan 93
Display panel: MediaPro; nView Corp., 804/873-1354; $7995.
Low-end panel: TFT Rainbow HD Model 700; Chisolm, 408/559-1111; $5295.
Complete LCD projector: System 6000; In Focus Systems, 503/692-4968; $8495.

VIDEO-CAPTURE BOARD, Jan 93
VideoSpigot; SuperMac Technology, 408/541-6100; $449 to $1399, depending on bundling options.

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93
Small-Business System: M.Y.O.B.; Teleware, 201/586-2200; $199.
Home Office/Personal Finance: MacMoney; Survivor Software, 310/410-9527; $119.95.

NETWORK/MULTIUSER ACCOUNTING, Nov 92
✣ Flexware II; Flexware, 916/581-6999; $695 to $895 per module. ✣ Great Plains Accounting; Great Plains Software, 701/281-0550; $795 per module.

PERSONAL FINANCE, Jun 93
✣ CheckWriter 4.0; Aatrix Software, 701/746-6801; $79.
✣ Andrew Tobias' Managing Your Money 5.0; MECA Software, 203/256-5000; $79.95.

SINGLE-USER ACCOUNTING (WITH PAYROLL), Nov 92
Checkmark MultiLedger and Payroll; CheckMark Software, 303/484-3541; $395.

SINGLE-USER ACCOUNTING (WITHOUT PAYROLL), Nov 92
M.Y.O.B.; Teleware, 201/586-2200; $199.

BUSINESS TOOLS

STATISTICS, Oct 93
Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; $595.
Comprehensive package: SYSTAT 5.2.1; SYSTAT, 708/864-5670; $895.

COMMUNICATIONS/NETWORKS

HIGH-SPEED FAX MODEM SOFTWARE, Oct 93
Faxstf; Telefocus, 816/886-9800; $79.

NETWARE CONNECTIVITY, Sep 93
NetWare for Macintosh; Novell, 801/429-7000; $495 for 5-user license to $2295 for 200-user license.

NETWORK MANAGEMENT, Feb 93
Network SuperVisor; CSG Technologies, 412/471-7170; $495.

NETWORK DIAGNOSTICS, Feb 93
Ethernet: EtherPeek; AG Group, 510/937-7900; $795.
LocalTalk: LocalPeek; AG Group, 510/937-7900; $495.

SOFTWARE ROUTER, Jul 93
Apple Internet Router 3.0; Apple Computer, 408/996-1010; Basic Connectivity Package $499.

TERMINAL EMULATOR, Oct 93
VersaTerm; Synergy Software, 215/779-0522; $149.

GRAPHICS

2-D CAD, Jan 93
Low-end: BluePrint; Graphsoft, 410/461-9488; $295.
Midrange: PowerDraw; Engineered Software, 919/299-4843; $795.

3-D DESIGN, Aug 93
Price for performance: ✣ Ray Dream Designer 2.0.4; Ray Dream, 415/960-0765; $299. ✣ Alias Sketch 1.5; Alias Research, 416/362-9181; $995.
All-in-one solution: ✣ Infini-D 2.5; Specular International, 413/549-7600; $995. ✣ StrataVision 3D 2.6.1; Strata, 801/628-5218; $995.

DRAWING PROGRAMS (LOW-COST), Sep 93
Budget draw: Expert Draw; Expert Software, 305/567-9990; $49.95.
Budget draw/paint: UltraPaint; Deneba Software, 305/596-5644; $79.
Beginners' program: Aldus SuperPaint; Aldus Corp., 619/695-6956; $149.95.
Overall: Canvas; Deneba Software, 305/596-5644; $399.

IMAGE DATABASES, Oct 93
✣ Aldus Fetch 1.0; Aldus Corp., 206/628-5739; $295.
✣ Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1530; $249.

PAINT AND IMAGE-EDITING, Sep 93
Budget buy: Expert Color Paint; Expert Software, 305/567-9990; $49.95.
Overall program: Fractal Design Painter; Fractal Design Corp., 408/688-8800; $399.
Image-editing program: Adobe Photoshop 2.5.1; Adobe Systems, 415/961-4400; $895.

ORGANIZATION/PRODUCTIVITY

CALENDARS, Jul 93
Alarm system: ✣ First Things First; Visionary Software, 503/246-6200; $79.95. ✣ Smart Alarms Plus; JAM Software, 203/630-0055; $125.
All-around scheduler: Now Up-to-Date; Now Software, 503/274-2800; $99.
Meeting scheduler: Meeting Maker; On Technology, 617/876-0900; five-pack $495.

PERSONAL INFORMATION MANAGEMENT, Feb 93
TouchBase/DateBook; After Hours Software, 818/780-2220; $169.95.

SALES-AUTOMATION SOFTWARE, Oct 93
✣ Contact Ease; WestWare, 619/660-0356; one user $395, five users $1495. ✣ CBS; Colleague Business Software, 512/345-9964; $495.

PRESENTATION TOOLS

MULTIMEDIA AUTHORING, Mar 93
Entry-level: ✣ Action; Macromedia, 415/252-2000; $495. ✣ Passport Producer; Passport Designs, 415/726-0280; $495.

UTILITIES

PRINTING, Sep 93
PC-printer cable packages: PowerPrint; GDT Softworks, 604/291-9121; $149.

SECURITY, Feb 93
File encryption and erasure: Citadel with Shredder; Datawatch Corp., 919/490-1277; $149.95.
Full-featured security: ultraSecure; usrEZ Software, 714/756-5140; $239.
Low-cost security: PassProof; Kensington Microware, 415/572-2700; $64.95. m

Vendors: Please write to Macworld Editors' Choice, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product's list price.

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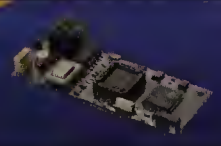

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Star Ratings

OVER 350 HARDWARE AND SOFTWARE REVIEWS AT A GLANCE

Edited by Wendy Sharp

Macworld Star Ratings lets you compare hardware and software products for the Macintosh by providing summaries of hundreds of *Macworld*'s authoritative product reviews. The number of stars at the beginning of each capsule review indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

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★★★★★ |- - - - - - - - - - - - - - - - - - - -| ★
Best Worst

Software

BUSINESS TOOLS

★★★ **4D Server 1.0.1, ACI US, 408/252-4444, $1495 to $3495.** Database server uses the ingenious multitasking technology built into 4D to make it appear that each client has the full resources of the server. If you use 4D on a network, you need this product. Jun 93

★★★★ **4th Dimension 3.0.1, ACI US, 408/252-4444, $895.** Multitasking, which greatly improves speed in a carefully designed application, makes this upgraded relational database delightful for both developers and end users. For a relational database, it's impressively easy to use. Apr 93

★★ **AccuZip6 1.5.2, Software Publishers, 714/846-1908, $899.** Professional-level mail-list management tool on CD-ROM is the most comprehensive system available, but its messy documentation and inexcusable user-interface violations make our reviewer reluctant to recommend it. May 93

★★★ **Acrobat Exchange, Acrobat Distiller, Adobe Systems, 415/961-4400, $195 to $2495.** Complete, well-planned paperless office system creates application-independent viewable files that can be readily distributed on a network. Still, it's not yet as inexpensive or as convenient as you might wish. Oct 93

★★★★ **Atlas Pro 1.0.6 (2.0), Strategic Mapping, 408/985-7400, $795.** Although this mapping software is not a complete geographic-information system, it boasts a rich feature set and a competitive price. Nov 92

★★★ **@Risk 1.1, Palisade Corp., 607/277-8000, $395.** Statistical simulator for Microsoft Excel financial computations generates complex, statistically valid templates within Excel and is the first choice for analysts who work with probabilistic models every day. It assumes that the user is an Excel power user. Aug 93

★★★★ **ClarisWorks 2.0, Claris Corp., 408/727-8227, $299.** Integrated program sets the standard. It provides more features, is easier to use and faster, and has better integration among modules than other available programs. Aug 93

★★★★ **Common Ground 1.0, No Hands Software, 415/321-7340, $189.95.** Simple, robust document interchange system is the clear choice for modest document-distribution jobs. In tests, it worked easily with documents from many different applications. Oct 93

★★ **EasyFlow 1.1, HavenTree Software, 613/544-6035, $229.** The rough edges and distinctly un-Mac-like attributes of this flowcharting software reflect its DOS heritage, although on the whole it's easy to use. Sep 93

★★★★ **FileMaker Pro 2.0, Claris Corp., 408/727-8227, $399.** Easier scripting, improved mailing labels and text-handling, and support for QuickTime and Apple events are the major new features of this upgraded, multiuser, flat-file database. Although it has some minor bugs, this is a strong upgrade to an excellent program. Jan 93

★★★ **FlowChart Express 1.0 (1.01), Kaetron Software Corp., 713/890-3434, $149.** Inexpensive, easy-to-use flowchart software readily meets the needs of most flowchart creators, although those with extensive requirements will need a larger, more powerful feature set. Jan 93

★★★★ **GeoQuery 3.02, GeoQuery Corp., 708/357-0535, $395.** Gain geographic perspective with this custom-map generator and data-analysis software that uses zip codes to create "pushpin" maps of files from your spreadsheet or database. Nov 92

★★★ **Helix Express 1.0, Helix Technologies, 708/205-1669, $439.** One of the most distinctive database products ever developed, this relational database has an iconic programming language that sometimes baffles traditional database programmers, but provides an easy route into basic data-handling chores for nonprogrammers. Helix Express is still the ultimate in multiuser simplicity for relational databases. Jul 93

★★★ **ithink 2.2.1, High Performance Systems, 603/643-9636, $695.** Although it requires a real training commitment for effective use, this product is an attractive dynamic business modeling system. It's a good bet for identifying cloudy spots in the crystal ball. May 93

★★ **Lotus Notes 3.0, Lotus Development Corp., 617/577-8500, $495 per client.** Well-organized, robust, and flexible business data system demands a full-time administrator, preferably with considerable programming experience, for effective use. Sep 93

★★★ **MacBarcoda 2.24, ComputaLabel, 508/462-0993, $349 to $895.** Compact, simple-to-use desk accessory creates bar codes in either EPS or Adobe Illustrator 1.1 format. DA cannot automatically create serial codes. Jun 93

★★★ **MacProject Pro, Claris Corp., 408/727-8227, $599.** If you're working on a midsize project and like using PERT charts, this may be the project-management software for you. However, the multistep scheduling process and the limited integration between charts are frustrating if you prefer Gantt charts. May 93

★★★★ **MarcoPolo 2.0, Mainstay, 805/484-9400, $395.** Inexpensive, easy-to-use product allows you or your workgroup to archive and retrieve documents, whether in electronic or paper form. Queries are easy to construct and searches are handled quickly. Sep 93

★★★ **Market Master Manager 3.5, Breakthrough Productions, 916/265-0911, $595.** Sales-automation software is designed to keep track of contacts, generate mailings, and make sure that leads don't fall through the cracks. It includes a remote module for sales reps in the field, but it has some odd user-interface features. Oct 93

★★ **Memorizer 2.0, Brains Software Engineering, 43-1-865-35-44 (Austria), $100.** Software records dictation from a Mac microphone and you transcribe the dictation in a word processor. You may prefer to stick with a hand-held tape recorder, considering the product's RAM and storage appetite, and its propensity to crash. Aug 93

★★★★ **Microsoft Excel 4.0, Microsoft Corp., 206/882-8080, $495.** Create impressive spreadsheets with this upgrade that includes all the features you wished for and more. It's slower, and needs 2MB of RAM for practical use, but almost all users will want to upgrade. Oct 92

★★★★ **Microsoft Project 3.0, Microsoft, 206/882-8080, $695.** An amazing range of functions, including new scheduling and formatting, are packed into this project-management software. The improved tool bar helps novices schedule tasks with push-button ease. Jan 93

★★★ **Microsoft Works 3.0, Microsoft, 206/882-8088, $249.** Capable but unspectacular upgrade delivers marginally improved functionality and a welcome face-lift to this integrated program, but there are a number of incompatibilities, odd design choices, and performance flaws. Feb 93

★★★★ **nuBase Pro 1.5 (1.7), Tactic Software Corp., 407/832-1400, $395.** Although still slower than FoxBase and without the rich feature-set of 4th Dimension, this is the only relational database that makes it possible for users with no programming experience to design a useful database. Sep 92

continues

MACWORLD Star Ratings

★★ **Office Wiz 1.1 (1.1.4), Oryx Associates, 415/563-9971, $595.** 4D-based program attempts to integrate calendar, project, and contact management, as well as simple accounting for a multiuser environment, but the complexity of the interface requires a substantial investment in start-up time. Nov 92

★★★ **Omnis 7 1.1, Blyth Software, 415/312-7100, $1250.** The plain, businesslike functionality of this database-development system produces solid applications without much fuss. Dec 92

★★★ **OrgChart Express 1.0, Kaetron Software, 713/890-3434, $279.** Organization-chart software links a database to standard box-drawing functions. Although the learning curve is steep, the effort may be worth it for people who regularly work with large or complex organization charts. Apr 93

★★★★ **Panorama 2.0 (2.1), ProVue Development Corp., 714/892-8199, $395.** Disarmingly easy-to-learn flat-file database is full of labor-saving data entry features, plus it boasts a remarkable macro function that lets you record and play back almost any series of database routines. May 92

★★★★ **Project Scheduler 5, Scitor Corp., 415/570-7700, $695.** For most midrange project-planning, this program's many hits outweigh its few misses. It goes beyond the requisite scheduling options, with inflation factors and unlimited projects in memory, and it conforms to accepted standards, so you get consistent, predictable results. Aug 93

★★★ **SpreadBase 1.0.1, Objective Software, 415/306-7410, $695.** Powerful business data-analysis tool is a unique combination of database and spreadsheet functions. It's worth a close look for power users, despite meager documentation and a cranky macro language. May 93

★★★ **Wingz 1.1ae, Informix Software, 913/599-7100, $399.** If you want a low-overhead spreadsheet with advanced-math functionality, this is an attractive product. What you get is a competent calculating engine with superior charts; what you miss is outlining,-real 3-D spreadsheet linking, and the host of third-party add-ons offered for Microsoft Excel. Jul 93

★★★ **WordPerfect Works 1.2, WordPerfect Corp., 801/225-5000, $249.** A very good word processor, a spreadsheet, a database, charting, drawing, painting, and communications make up the seven well-integrated and flexible modules of this program. It has a few shortcomings, including some memory-management problems, but buyers should generally be pleased. Jun 93

COMMUNICATIONS/NETWORKS

★★★ **A/UX 3.0, Apple Computer, 408/996-1010, $795.** Hybrid–operating-system package implements the Stone Age, type-one-line-at-a-time text interface of Unix in a way a Macintosh user might actually like. Nov 92

★★★ **CompuServe Information Manager 2.0.1, CompuServe, 614/457-8600, $49.95.** The goal of this product is to give friendlier information-access to CompuServe for Macintosh users. An appealing color interface and increased speed are signs of success, but there's still room for improvement. Dec 92

★★★★ **MicroPhone Pro, Software Ventures Corp., 510/644-3232, $295.** Truly comprehensive telecommunications package now includes send-and-receive fax software. Although the new TCP/IP tools are complicated, the documentation is clear and precise. Apr 93

★★ **NetVirtual 2.0, Eclectec, 408/462-2040, $995 to $4985.** One-of-a-kind network-simulation product favors flexibility at the expense of usability. Only after hours of work will your simulation report anything meaningful about your network, and even then the results are difficult to analyze. Apr 93

★★★ **Network Vital Signs 1.0 (1.1), Dayna Communications, 801/531-0600, $449.** Fault-monitoring application continually watches selected network devices and services, monitoring specific equipment for specific errors. Unfortunately, when monitoring more than ten devices, it noticeably degrades the performance of the monitoring Mac. Mar 93

★★★ **On the Air 1.0.1, Digital Eclipse Software, 510/547-6101, $79.99 to $639.99.** Intercom system transmits System 7 SND resources, SoundEdit, and AIFF sound files across a network. It's well designed and performs decently, but its usefulness seems limited. Aug 93

★★ **SoftPC with Windows, Insignia Solutions, 415/694-7600, $499.** The emulation of a complete and accurate Windows environment on a Mac is an amazing accomplishment, but the product is so slow, even on a Quadra, that it performs in what might best be characterized as a dreamlike languor. Jun 93

★★★★ **TechWorks Net Utilities 1.0, Technology Works, 512/794-8533, $129.** Collection of five applications provides essential network-monitoring tools at a price that would please anyone. Dec 92

★★★★ **Timbuktu 5.0.1, Farallon Computing, 510/814-5000, $199 to $5500.** By letting one computer (a Mac or a Windows-based PC) control, observe, or exchange data with another computer, this terminal-emulation product allows you to use resources almost anywhere on a network. Despite minor blemishes, it's a clear winner. Mar 93

DESKTOP PUBLISHING

★★★★ **Aldus Fetch 1.0, Aldus Corp., 206/622-5500, $295.** The rich feature set and network support of this image-cataloging software make it a clear winner. Although cataloging is slow, users have fine control of the depth and compression of thumbnails. Aug 93

★★ **Aldus Personal Press 2.0, Aldus Corp., 206/628-2320, $199.** Basic, inexpensive page-layout program adds features and gains strength, but is still missing elements that novice users need, such as automatic kerning. Furthermore, its software-knows-best approach to copyfitting makes manual fine-tuning difficult and is almost certain to confuse and confound beginners. Mar 93

★★★ **Apple Font Pack, Apple Computer, 408/996-1010, $99.** Apple's first collection of TrueType fonts includes only 12 fonts that haven't been available since the late eighties in the PostScript format. Still, it's not a bad deal, considering that Adobe PostScript fonts cost four times as much. Mar 93

★★★ **Cumulus 1.1, Canto Software, 415/431-6871, $295.** Good network support, plus a feature that creates a protocol file for recording user actions, make this image-cataloging program a good choice for workgroups. It doesn't have an image preview feature, or offer 32-bit thumbnails. Aug 93

★★★ **Expanded Book Toolkit 1.0.1, The Voyager Company, 310/451-1383, $295.** Using this hypermedia publishing program, average mortals can create highly functional multimedia books in a fraction of the time it would take to do the job unassisted. Be aware, though, that it's no QuarkXPress. Jun 93

★★★★ **FontMonger 1.5.7 (1.5.9), Ares Software Corp., 415/578-9090, $149.95.** Font-conversion utility provides cross-platform, cross-font conversion and makes it easy to create composite, subscript, superscript, and rotated characters. Sep 93

★★★★ **Fontographer 3.5 (3.5.1), Altsys Corp., 214/680-2060, $495.** Versatile tools that enable you to edit PostScript typefaces or create your own are the highlight of this font-design software. But beware, some processes are technical and cumbersome. Nov 92

★★ **ImageAccess 1.0, Nikon, 516/547-4355, $495.** This expensive image-cataloging program has an unusual interface and cannot be used over a network. A plug-in module provides direct support for Nikon's LS-3510AF film scanner. Aug 93

★★★ **Kodak Color Sense 1.0, Eastman Kodak, 716/253-0740, $499.** Color-management system gives average users access to a reasonable level of color consistency at a reasonable price. It does not make color separations. Oct 93

★★ **Kudo Image Browser 1.0, Imspace Systems Corp., 619/272-2600, $295.** This image-cataloging software cannot control thumbnail depth or compression, and doesn't have a keyword feature or allow multiple users to access the catalog simultaneously. The unique Riffle feature lets you quickly scan images. Aug 93

★★★ **Lazy Dog Foundry Personal Font, Lazy Dog Foundry, 612/291-0306, $199.99 to $499.99.** Type 1 font made from your handwriting has clean, even lines—whether or not your writing does. Apr 93

★★★ **Personal Font, Signature Software, 503/386-3221, $179.95.** Turn your handwriting into a PostScript Level 3 or a TrueType font. The results are good, although not perfect—TrueType letters were not connected on screen, but this should be corrected with TrueType 2.0. Dec 92

★★★ **Publish It Easy 3.0, Timeworks, 708/559-1300, $199.95.** Desktop-publishing program offers writing, editing, formatting, page-layout, drawing, and painting tools with well-thought-out interface innovations, plus an excellent database manager. Unfortunately, the program is unstable and crash-prone. Mar 93

★★★ **Renaissance 1.0, Eastman Kodak, 800/433-2839, $695.** A strange mixture of power and oversight, this page-design and -layout software provides several slick features, including handling multiple page sizes simultaneously, but blatantly ignores common Mac conventions, such as some keyboard shortcuts. Dec 92

★★★★ **Spectacular 1.2, FontHaus, 203/846-3087, $59.** Keep track of fonts efficiently and effectively with this type-specimen generator. Printing specimen sheets is a cinch. Jan 93

★★★★ **SuperATM, Adobe Systems, 415/961-4400, $149.** This upgrade to Adobe Type Manager lets you view Adobe-brand PostScript fonts on screen and output them at high resolutions, even when the corresponding printer fonts are unavailable. Although it has limitations, this is an outstanding advance in font technology and a tremendous value. May 93

EDUCATION

★★★★ **Algebra, Broderbund Software, 415/382-4400, $89.95 to $99.95.** Interactive, imaginative math tutorial is keyed to the standard textbook order of topics, but offers much more. It is particularly strong on word problems and graphing. May 93

★★★ **The Castle of Dr. Brain 1.0, Sierra On-Line, 209/683-4468, $49.95.** Use logic and raw brain-power to navigate a series of rooms, mazes, and hallways. Puzzles range from simple and mundane to creatively laborious. Dec 92

★★ **Comprehensive Review in Biology, Queue, 203/335-0908, $295.** There isn't a textbook publisher in North America with the nerve to publish a black-and-white biology book with nothing more than text and basic line drawings, much less charge several hundred dollars for it, but that, in effect, is what this CD-ROM is. May 93

★★★ **Compton's Multimedia Encyclopedia 1.00M, Compton's New Media, 619/929-2626, $795.** The down-to-earth writing style and numerous bells and whistles of this multimedia encyclopedia on CD-ROM appeal to younger readers, but the high cost and sluggish performance may be prohibitive. Apr 93

★★★★ **Decimal & Fraction Maze 1.2, Great Wave Software, 408/438-1990, $69.95 to $89.95.** Education software weaves the threads of eight math curricula—from third grade to eighth, along with two levels of adult education—into an interesting and visually stimulating game. Jul 93

★★ **Dvorak on Typing 1.0, MacPlay, 714/553-3530, $49.95.** Typing tutor offers solid lessons, but the small annoyances, such as never being able to take intermediate or advanced lessons without first passing a test, add up. Jun 93

★★★ **Eco-Adventures in the Ocean, Eco-Adventures in the Rainforest 1.0, Chariot Software Group, 619/298-0202, $59.95.** Explore the ocean or rainforest while avoiding pitfalls and predators in these educational adventure games. Imaginary landscapes that combine features found in different environments may confuse some students. Nov 92

★★★ **Headline Harry and the Great Paper Race 1.0, Davidson & Associates, 310/793-0600, $59.95.** Travel through time and across the country as a journalist in this history/geography game. While not an educational masterpiece, it is lots of fun. Dec 92

★★★ **MacGlobe 1.3.0, Broderbund Software, 415/382-4400, $44.95.** Besides maps and bits of fun, such as national anthems, this geography software offers an impressive quantity of demographic and economic information. While it could stand some improvement in data export, it provides a fascinating intellectual adventure. Feb 93

★★★★ **Mavis Beacon Teaches Typing 2.0, The Software Toolworks, 415/883-3000, $49.95.** If being entertained while learning to type interests you, this typing tutor provides varied environments, interesting lessons, and good games. Jun 93

★★★ **Millie's Math House, Edmark Corp., 206/556-8400, $49.95.** Early math-education software provides a variety of ways for preschoolers to experiment with numbers and counting. It's entertaining and engaging, but more advanced levels and more flexibility would keep children challenged longer. Jul 93

★★★★ **The New Grolier Multimedia Encyclopedia, Grolier Electronic Publishing, 203/797-3530, $395.** The remarkably current and scholarly text of this encyclopedia on CD-ROM is suitable for sophisticated readers, while its speed, ease of use, and value are impressive. Apr 93

★★ **NihongoWare, Vol. 1, Qualitas Trading Company, 510/848-8080, $349.** Although this Japanese language CD-ROM offers solid instruction, it's so expensive and so limited in its word selection that it's not an economical choice for individual users. Jan 93

★★ **The Secret Codes of C.Y.P.H.E.R. 1.0 (1.1), Tanager Software Productions, 510/430-0900, $59.95.** Intriguing facts about mammals and a variety of alphabets provide the interest in this educational game, but the inescapable, repetitive animations are a major detraction. Apr 93

★★★ **The Secret Island of Dr. Quandary 1.0 (1.01), MECC, 612/569-1500, $49.95 to $69.95.** Clever package of gorgeous landscapes, catchy sounds, and tempting arcade-game puzzles uses math, logic, and reading skills. Although somewhat slow, it's fun for parents and kids. Jun 93

★★★ **Stickybear's Reading Room 2.2a, Optimum Resource, 803/785-7441, $59.95.** Educational game with four different activities takes a sedate but direct path to building primary-level reading skills. It's appropriate for ages four to eight, but probably too juvenile for older kids. Jun 93

★★★★ **Where in America's Past Is Carmen Sandiego? 1.0 (1.3), Broderbund Software, 415/382-4400, $44.95.** Travel in time and the U.S. chasing those V.I.L.E. crooks in this clever educational history/geography game that's challenging for all ages. Mar 93

ENTERTAINMENT

★★★★ **A-Train, Maxis, 510/254-9700, $69.95.** Charming railroad simulation offers astonishing, and often witty detail, but the learning curve is high and the interface isn't completely Mac-like. Apr 93

★★ **America Alive, MediaAlive/CD Technology, 408/752-8500, $99.** QuickTime movies, photographs, maps, text, and audio mingle in this multimedia CD-ROM guide to the U.S. It's a promising concept, but it doesn't yield much useful information. Mar 93

★★★★★ **Arthur's Teacher Trouble, Broderbund Software, 415/382-4400, $59.95.** Every page of this delightful animated book is dense with surprises that arouse and satisfy a child's curiosity. In the words of six-year-old Alex, "It's like chocolate ice cream. You can have it more than once and it's still good." Apr 93

★★★ **Battle Enhanced Chess CD ROM, Interplay Productions, 714/553-6678, $79.95.** Elaborately detailed cartoon characters act out little dramas of strategy and capture, complete with sound effects, in this chess game that will drive nine-year-olds mad with glee but may annoy experienced chess players. Mar 93

★★★ **The Battle of Britain, Deadly Games, 215/295-2284, $39.95.** It's August 10, 1940. The badly outnumbered British must defend their country against the invading Luftwaffe, and you're in charge. Although the graphics and sound are not spectacular, this is an entertaining, thinking person's game. Dec 92

★★★ **BlackJack Trainer, ConJelCo, 412/492-9210, $75.** Learn the strategies you need to win at blackjack with this program that teaches card counting and strategies. There are a number of trivial bugs, but they won't get in the way. Oct 93

★★★ **Cogito 1.0, Inline Design, 203/435-4995, $59.95.** Rubik's Cube fans will like this challenging game where the goal is to replicate a pattern by moving rows and columns of tiles. It gets more and more complex as you progress through the 120 levels. Apr 93

★★★ **Daily Sports Quiz 1.0, DreamTime, 619/236-1341, $49.95.** If you think you know a lot about sports and love to play trivia games, then this entertaining and informative game is for you. Each time you start up your Mac, three sports trivia questions from eight different categories appear on your screen. Oct 93

★★★★ **Go Master 5, Toyogo, 802/464-5526, $69.** Go has been called the most interesting board game ever invented. This excellent software version incorporates helpful learning aids and sample games. Dec 92

★★★★ **Hellcats Over the Pacific 1.0.3, Graphic Simulations, 214/699-7400, $69.95.** Fly a WWII-era Navy fighter, the Grumman F6F Hellcat, against enemy planes in the South Pacific with this flight simulator that offers smooth graphics, good special effects, and great documentation. Apr 93

★★★ **Indiana Jones and the Fate of Atlantis, LucasArts Games, 415/721-3300, $59.95.** In this game, the whip-wielding archaelogist goes looking for the mythological city of Atlantis and finds it armed to the gills with magical technology and Nazi stooges. If you're not bothered by the story's astonishing sexism, you'll find it a diverting experience. Oct 93

★★★★ **Insanity 1.0, UV Wave, 318/868-9944, $39.95.** Shoot your Mac with this cool control panel device that offers a choice of nine weapons, ranging from an Uzi to a pigeon. It has first-rate sound effects and detailed animation, but the novelty wears off. Feb 93

★★★★ **Jewelbox 1.5, Varcon Systems, 619/563-6700, $49.95.** This gem of a game is strongly reminiscent of Tetris. The jewels fall into rows that disappear when you place three jewels of a kind together. Jun 93

★★★ **The Journeyman Project, Presto Studios, 619/689-4895, $99.95.** Interactive science-fiction epic on CD-ROM is a work of art. The scenes are rich with painstakingly detailed graphics, elaborate models, and subtle textures, but the sluggish pace may leave you impatient and bored. Sep 93

★★★★ **Maelstrom 1.03, Ambrosia, P.O. Box 23140, Rochester, NY 14692-3140, $15 plus $5 shipping and handling.** Fast-paced arcade game is loosely modeled after Asteroids, the Atari classic. Maelstrom features superb animation, hilarious sound effects, exciting action—and best of all, it's shareware. Jun 93

★★★★ **Monkey Island 2: LeChuck's Revenge, LucasArts Games, 415/721-3394, $59.95.** This whimsical Twilight Zone of life on the high seas is the adventure-game equivalent of *Mad* magazine, filled with witheringly sarcastic dialogue, splendid gross-out jokes, heapings of self-parody, and enough hilarious detail to keep you amused for days. May 93

★★★ **Mozart: The "Dissonant" Quartet, The Voyager Company, 310/451-1383, $59.95.** This CD-ROM includes an unusual essay on the anatomy of stringed instruments, brief discussions of general musical concepts, an analytical overview of the quartet, and a taped

continues

MACWORLD Star Ratings

minilecture on Mozart's life, but sadly enough the music is limited almost entirely to the title piece. Apr 93

★★ **The Orchestra: The Instruments Revealed, Time Warner Interactive Group, 818/955-9999, $79.98.** The many-branched, interwoven, hypertext style of this music-education CD-ROM makes it hard to navigate and digest, despite its richness. For the price, other music-education CD-ROMs present better values. Apr 93

★★★★ **Poetry in Motion, The Voyager Company, 310/451-1383, $29.95.** Performance videos of contemporary poets are juxtaposed with the texts of their poems and taped interviews in this intriguing CD-ROM that combines the excitement of the stage with the reflective appeal of the page. Feb 93

★★★ **Red Baron 1.0, Dynamix, 800/326-6654, $69.95.** The romance of history and the realism of a flight simulator combine in this World War I flight game. Despite small annoyances, including too many dialog boxes to get to the simulation, this game will charm any aspiring ace. Nov 92

★★★★ **Richard Strauss: Three Tone Poems, The Voyager Company, 310/451-1383, $59.95.** *Don Juan, Till Eulenspiegel,* and *Death and Transfiguration* are the three works included in this CD-ROM, with a program written by Russell Steinberg. The musical analysis is satisfying, and the lush orchestral music will appeal to both novice and experienced classical music listeners. Apr 93

★★★ **Rodney's Wonder Window, The Voyager Company, 310/461-1383, $39.95.** Collection of 23 colorful, wacky graphics and animations by Rodney Alan Greenblat is charming but uneven. The overall look is surreal and cartoonish, but while some modules are elaborate and sophisticated, others are simple and not particularly interesting. Mar 93

★★★ **Schubert: "The Trout" Quintet, The Voyager Company, 310/451-1383, $59.95.** Alan Rich, classical music commentator for National Public Radio, conveys his enthusiasm for this appealing music in this CD-ROM's lively text. However, the discussion is relatively unchallenging and the musical performance, though well regarded, is not at the top of most reviewers' lists. Apr 93

★★★★ **Seven Days in August, Time Warner Interactive Group, 818/955-9999, $79.99.** Compelling, interactive documentary on CD-ROM cuts a slice from history and offers August 10 through August 16, 1961, (the building of the Berlin Wall) to viewers in a way that truly evokes the period. Oct 93

★★★ **Sherlock Holmes, Consulting Detective, Volume II, Icom Simulations, 708/520-4440, $69.95.** Match wits with the legendary detective by solving three difficult mysteries in this CD-ROM game. May 93

★★★ **SimLife, Maxis, 510/254-9700, $69.95.** A megalomaniac's dream come true, this amazingly intricate simulation game lets players create and control ecosystems. It's not easy, but the reward is an increased understanding of the complex interrelationships of life. Feb 93

★★★★ **So I've Heard, Volume 1: Bach and Before, The Voyager Company, 310/451-1383, $24.95.** Engaging text by classical-music critic and lecturer Alan Rich describes nearly two millennia of western music (up to the mid-eighteenth century) in this CD-ROM. It offers a unique and affordable opportunity to sample 50 or so performances, styles, and compositions. Feb 93

★★★ **Space Quest 1: Roger Wilco in the Sarien Encounter, Sierra Online, 209/683-8989, $19.95.** As Roger Wilco, starship janitor, you must defeat the evil Sariens in this adventure game where your head is more important than your hands. Puzzles range from the obvious to the head-scratching, but for most players the game will be easy to complete. Apr 93

★★★ **Super Mines 1.0, Callisto Corp., 508/655-0707, $49.95.** You use logic to search a minefield without setting off mines in this fast-paced game that is easy to learn, but offers 84 levels for long playability. Apr 93

★★★ **V for Victory: Utah Beach, Three-Sixty Pacific, 408/879-9144, ext. 23, $69.95.** The post–D-Day conquest of Normandy is re-created in this game; its strength is the way it blends easy play with complicated strategy. Some bugs exist. Oct 93

★★★ **Warlords, Strategic Studies Group, 904/494-9373, $49.95.** A medieval fantasy world is the setting for this colorful game of strategy and conquest with beautiful graphics. Unfortunately, the computer opponents are not challenging enough for an experienced war-gamer, although human opponents may be. Dec 92

★★★★ **Who Killed Sam Rupert, Creative Multimedia Corp., 503/241-4351, $39.99.** You're a police detective trying to solve the murder of a popular restaurateur in this interactive CD-ROM that exploits the full range of multimedia options and provides a wealth of clues and surprises to hold your interest. May 93

FINANCE/ACCOUNTING

★★ **Andrew Tobias' TaxCut for Macintosh, MECA Software, 203/256-5000, $79.95.** The occasionally awkward interface of this personal tax-preparation software doesn't follow every Mac standard, but the help system is very good. State versions are available for California and New York. May 93

★★★★ **BestBooks 1.0, Teleware, 201/586-2200, $99.** In a straightforward, unintimidating manner, this small-business accounting program integrates the standard bookkeeping functions of accounts receivable, accounts payable, and general ledger. There's little to criticize, except the weak documentation. Jul 93

★★ **Business Sense 1.6, Software Developers Consortium, 801/288-2216, $199.** Competent, single-user, all-in-one bookkeeping package will adequately help you keep the books for a small company, but it's not as easy to use as its competition. Feb 93

★★★ **MacInTax 1992, Chip Soft, 619/453-8722, $79.95.** It's difficult to correct your errors when using this personal tax-preparation software, but it's definitely easier than doing your taxes by hand. The display is attractive, the program supports electronic filing, and there are 15 state-tax versions available. May 93

★★★★ **Managing Your Money 5.0, MECA Software, 203/256-5000, $79.95.** An already strong financial-management program becomes easier to use and slightly more powerful with this upgrade. Jan 93

★★★ **WealthBuilder 2.0, Reality Technologies, 800/346-2024, $79.99.** Financial-planning software forces you to think about your money and helps you develop an investment plan. It's a good program for beginning investors, but more-sophisticated investors will want more-advanced features. May 93

GRAPHICS

★★★ **addDepth 1.0.2, Ray Dream, 415/960-0768, $179.** The purpose of this graphics program is to enhance the creation of 2-D images with 3-D effects. It's versatile, accommodating, and affordable, but working on complex images gets tedious because of the automatic application of styles. Aug 93

★★★ **Adobe Dimensions, Adobe Systems, 415/961-4400, $199.** This three-dimensional-effects utility may seem very limited, with white-only light and no surface texturing, but it's a ground-breaking product. It performs its 3-D illusions within the object-oriented, resolution-independent world of PostScript. Apr 93

★★★★ **Adobe Photoshop 2.5, Adobe Systems, 415/961-4400, $895.** No graphics program is as universally loved and as downright deserving of user loyalty as this one, but while this upgrade builds on the program's wide range of capabilities, it ignores some minor weaknesses that have begun to peek through the product's armor. It's still great but perhaps not perfect. Jun 93

★★★ **Aldus FreeHand 3.1 (3.11), Aldus Corp., 206/628-2320, $595.** A pressure-sensitive freehand tool is the most remarkable new feature of this updated drawing program. Substitution for missing fonts is another good addition, but skimpy text-editing tools and incomplete support for EPS continue to diminish its value. Jun 92

★★★★ **Alias Sketch 1.5, Alias Research, 416/362-9181, $995.** The enhanced modeling and revamped rendering capabilities of this 3-D illustration program contribute to a tremendous and reliable upgrade, a heartening example of a company listening to its users and delivering on its promises. Jul 93

★★ **ArtBeat Professional 1.0, Pie Practical Solutions, 201/902-9500, $249.** Despite a smattering of unique capabilities, this inexpensive draw/paint program lacks many features of equivalent programs. Apr 93

★★★ **artWorks 1.0, Deneba Software, 305/596-5644, $149.** If you're expecting a graphics dynamo, this combination paint and draw program will leave you a little cold. But despite its flaws, it ranks as one of the best graphics programs available under $200. Jun 93

★★ **AutoCAD Release 11 (12), Autodesk, 415/332-2344, $3500.** Customizable, bare-bones drafting upgrade partially implements a graphical user interface. Few add-ons are currently available. Dec 92

★★★★ **Blueprint 4.0, Graphsoft, 410/461-9488, $295.** Entry-level 2-D drafting program is a wonderful antidote to the complicated CAD system blues. Don't be misled by the low price; this full-fledged drafting package is powerful enough to serve professionals who appreciate the value of simplicity. Jul 93

★★ **BrushStrokes 1.0, Claris Clear Choice, 408/727-8227, $139.** If you have absolutely no experience with computer graphics, the simplified interface of this 24-bit paint program might warrant its price. Otherwise, you can find better programs for less. Oct 93

★★★ **CA-Cricket Draw III 2.0, Computer Associates International, 516/342-5224, $249.** This draw program is not going to inspire experienced Mac artists to jump up and down, but its features are abundant, the interface is straightforward and functional, and the price is right. Oct 93

★★★ **Cachet 1.0 (1.2), Electronics for Imaging, 415/742-3400, $595.** The tools, interface, output,

and documentation of this color-image editor are all quite impressive for a first version, but serious failings include slowness and disappointing sharpening. Dec 92

★★★ **Color It 2.0.1, Timeworks, 708/559-1300, $299.95.** Overpriced color paint program has a full range of painting and image-retouching capabilities, including 15 levels of undo and an impressive magic-wand tool, but its naming conventions are bewildering. Apr 93

★★ **CPM Graphic Tutor 1 & 2, Caseys' Page Mill, 303/220-1463, $489 per volume.** Although some neophytes may find these CD-ROM tutorials on Adobe Illustrator and Adobe Photoshop helpful, the programs' distracting interfaces, inconsistent execution, lack of polish, and high price weigh strongly against them. May 93

★★★ **DesignCAD 2D/3D 3.0.1 (4.0), DesignCAD, 918/825-4848, $499.95.** Despite slow rendering, this general-purpose 3-D modeler with 2-D drafting capabilities represents a price and performance breakthrough in 3-D modeling programs. Nov 92

★ **Easy Color Paint 3.0, MECC, 612/569-1500, $59.95.** For a program that purports simplicity, this color paint program is anything but. Possibly the weakest, least intuitive paint program for the Mac, it's unnecessarily complex and frustrating. Jul 93

★★★★ **ElectricImage Animation System 1.5.1, Electric Image, 818/577-1627, $7495.** The most powerful animation program for the Mac improves its documentation and rendering, and adds an intuitive project window that allows you to control all aspects of animation from a single location. Unfortunately, it still retails for the price of a European vacation for two. Feb 93

★★★ **Expert Draw 1.0, Expert Software, 305/567-9990, $49.95.** Inexpensive draw program is not really for experts, but it offers a decent, no-frills set of basic drawing tools and commands for beginning illustrators, office use, or anyone on a budget. Aug 93

★★★★ **Folio 1 Media Kit, D'Pix, 614/299-7192, $299.95.** Each image in this texture collection on three CD-ROMs provides a dynamic range of colors, highlights, and shadows; is free of artifacts; and is crisply focused. The collection as a whole is well chosen, although the high-resolution images are hard to access. Aug 93

★★★★ **Fractal Design Painter 2.0, Fractal Design Corp., 408/688-8800, $399.** If you can put up with a few inconveniences and surprises, this color paint software provides the real meat-and-potatoes tools required by professional artists, and many of its functions—natural media brush tools, the color-sensitive magic wand, 2-D lighting effects—are entirely without peer. Jul 93

★★★ **Generic CADD 2.0, Autodesk, 206/487-2233, $495.** Competent, midlevel 2-D drafting program has a well-executed Mac interface, a good complement of tools, and a sprinkling of high-end features, such as floating-point precision. Aug 93

★★ **Image Assistant 1.0, Caere Corp., 408/395-7000, $495.** Besides unsatisfactorily addressing Adobe Photoshop's small list of liabilities, this image-editing software is barely able to keep up with less expensive bitmap editors. Problems include an unforgivable lack of antialiased text, no selective revert function, and an incorrectly implemented smudge tool. Apr 93

★★★★ **Infini-D 2.0 (2.5), Specular International, 413/549-7600, $995.** Rich combination of 3-D modeling, rendering, and animation tools at a relatively affordable price. Visualization program works well, offers a nicely integrated approach to rendering, and is generally stable. Jan 93

★★★★ **IntelliDraw 1.0, Aldus Corp., 206/628-2320, $299.** Crowd-pleasing features such as physical and dynamic links make this automated draw program a great environment for planning and presenting, although it's less satisfying as a free-form drawing tool. Nov 92

★★★★ **Kai's Power Tools Volume 1 1.0, HSC Software, 310/392-8441, $149.** Photoshop plug-ins include image-editing filters; texture, gradient, and fractal generators; and special-effects tools. Although at times monstrously complicated, this collection represents a virtually infinite supply of visual resources. It's an amazing tool that no regular Photoshop user should be without. May 93

★★★★ **MiniCAD+ 4, Graphsoft, 410/461-9488, $795.** Professionals should be delighted with this highly competent CAD package's evolution into 3-D. It has maintained its features-champion status and is easier to use. Mar 93

★★★ **Ofoto 2.0, Light Source Computer Images, 415/461-8000, $395.** Many new features—notably color support—have been added to the already impressive toolbox of this scanning software. It often produces good results, but it rarely produces the best scan possible for a given image and output method. Jul 93

★★★★ **Paint It 1.0, Timeworks, 708/559-1300, $59.95.** Straightforward color paint program lacks image-editing tools but has a versatile cast of selection and painting tools—and it's priced to sell. Apr 93

★★★★ **PosterWorks 3.0, S.H. Pierce & Co., 617/338-2222, $395.** This large-format graphics production tool is for people who think big, up to 10,000 square feet big. It fills the need for user-defined, full-color, large-format output robustly and elegantly. Aug 93

★★★★ **PowerDraw 4.0, Engineered Software, 919/299-4843, $795.** The best new feature of this polished 2-D drafting program is an open architecture that supports modules that let you customize the program with application-specific tools, floating palettes, and menu commands. Sep 93

★★★★ **Ray Dream Designer 2.02 (2.06), Ray Dream, 415/960-0765, $299.** Experienced 3-D aficionados will find this 3-D–imaging software a welcome addition to their arsenal, and beginners may find it ideal for the leap from 2-D to 3-D. Improved text-handling and viewing capabilities would make it even better. Sep 92

★★★★ **Sketcher, Fractal Design, 408/688-8800, $149.** A variety of effects reproduce techniques of traditional drawing tools with this wonderful gray-scale paint and image processing program. Feb 93

★★★★ **Smoothie 1.02, Peirce Software, 408/244-6554, $149.** Create smoother screen images with this handy utility that antialiases the edges of on-screen artwork. Although it can't accommodate sound or accept imported QuickTime movies, it's a must for anyone who uses a Mac for presentations. Nov 92

★★ **StrataType 3d 1.0 (2.0), Strata, 801/628-5218, $199.** The rulers, texture palette, custom bevels, and canned positioning schemes of this 3-D type-effects software are nice, but they can't compare with the animation skills, lighting capabilities, and superb rendering of other available programs. Mar 93

★★★ **Tree, Onyx Computing, 617/876-3876, $295.** Single-purpose program generates lifelike color drawings of trees from a number of easily controlled parameters. Although visually appealing, it's an expensive way to draw a tree. May 93

★★★ **Typestry 1.0 (1.1), Pixar, 510/236-4000, $299.** Type enters the third dimension with this reasonably priced 3-D typographic effects and animation program. There's room for improvement, but it's an exciting tool for designers, multimedia producers, and those who enjoy working with type. Nov 92

★★★ **Virtus WalkThrough 1.1.3, Virtus Corp., 919/467-9700, $495.** Interactive 3-D modeling tool provides instantaneous access to rendered 3-D scenes, allowing you to travel through models at will. While it has some problems (such as occasionally just quitting), it's an excellent value that may change both how you design and how you think about design. Jul 93

★★★ **Wraptures One, Wraptures Two, Form and Function, 619/536-9999, $95 each.** The images in these texture collections on CD-ROM are generally acceptable, although some are muddy and others are difficult to decipher at low resolutions. If you need images for repeating patterns, however, these repeat seamlessly and are a good value. Aug 93

MATH/SCIENCE

★★★ **Alchemy III, Tripos Associates, 314/647-1099, $950.** Molecular-modeling software can model decapeptides and DNA fragments, in addition to the expected small molecules, with refreshing alacrity on a Mac IIci or better. Sep 93

★★★ **Amazing Universe 2.1, Hopkins Technology, 612/931-9376, $79.95.** Space-image exploration package on CD-ROM offers an amazing variety of astronomical images with a very competent program (ProVision II) for modifying and inspecting those images. It assumes that users won't be fazed by such things as writing their own image-convolution matrices. Aug 93

★★★ **Caduceus Physics 1.0, Scientia, 617/776-3427, $130.** Giant HyperCard stack consists of carefully indexed cards covering small conceptual bites of physics; it's the first in a series designed to prepare students for the Medical College Admissions Test. Jan 93

★★★★ **CircuitMaker 3.0, MicroCode Engineering, 801/226-4470, $200.** Much of the tedium of diagramming circuits and constructing prototypes is relieved by this digital circuit simulator that provides a powerful set of basic tools for a very reasonable price. Aug 93

★★★★ **Data Desk 4.0 (4.1), Data Description, 607/257-1000, $595.** For finding patterns in data, this statistical-analysis program has no peer. Years of refinement have made it a unique, and uniquely valuable, tool for analysis, despite its lack of some tests found in larger programs. May 93

★★★ **Expert Astronomer 1.0 (1.1), Expert Software, 305/567-9990, $49.95.** Draw maps of the sky from any location in the Solar System and learn about celestial objects with this astronomy software. Most effective in color, this is a great educational tool for beginners and a reference database for experts. Dec 92

★★★★ **Expressionist 3.0 (3.01), Prescience Corp., 415/543-2252, $199.95.** If you work regularly on similar topics, you can customize this equation-writing software to produce equations with exactly the appearance you want, letting you work at amazing speed. Mar 93

continues

MACWORLD Star Ratings

★★★ **f(z) 6, Lascaux Graphics, 602/299-0661, $115.** The main problem this math software attacks is four-dimensional visualization. It costs slightly more than a textbook, making it a great educational bargain. Sep 93

★★★ **FA5TAT 2.0, 5YSTAT, 708/864-5670, $495.** Statistical business-analysis software makes sense as a day-to-day statistics tool for business or scientific users. It provides the right statistical tests for most requirements, and its graph types provide plenty of information, although they lack glamour. Jun 93

★★★★ **HiQ 2.0, Bimillennium Corp., 408/354-7511, $995.** The three great strengths of this numerical mathematics software are its fast and capable differential-equation-solving section, its excellent matrix-math capabilities, and its very natural notebook-format interface. Sep 93

★★★★ **Interactive Physics II 1.0 (1.01), Knowledge Revolution, 415/553-8153, $399.** Motion simulation software is an improvement over traditional classroom instruction in physics. This new version greatly expands the range of problems that can be solved, and adds support for QuickTime. Dec 92

★★★ **LabTutor 2.0, J. K. Eaton, 415/723-1971, $50.** Tutorial on laboratory computer-interfacing provides a detailed, thorough exposition of computer interfacing in general, but it requires LabView and a National Instruments interface board for its exercises. Sep 93

★★★★ **MacBreadboard 1.1 (1.13), Yoeric 5oftware, 919/644-1620, $59.95.** Useful educational engineering software simulates with excruciating detail every aspect of a digital integrated-circuit breadboard trainer. It accurately replicates and even surpasses the behavior of a physical breadboard—without burning out IC chips. Dec 92

★★★★ **MacPhase 1.2, Otter 5olutions, 315/768-3956, $159.** Low-cost, scientific-data-visualization software with a large assortment of mathematical tools is one of the few authentic bargains in science software. One of its principal strengths is a well-planned color lookup table editor that's delightfully easy to use. May 93

★★★ **MathCAD 3.1, MathSoft, 617/577-1017, $495.** Numerical and symbolic computation software is easy to learn, easy to use, and is much more powerful than earlier versions. It doesn't compete in scope with the largest math programs, but for most science and engineering tasks, it's a fast way to get problems solved. Jun 93

★★★★ **Mathematica 2.2, Wolfram Research, 217/398-0700, $595.** The one essential program in science and mathematics adds a function browser that makes the program as easy to use as it should be, as well as improvements to computational routines. Sep 93

★★★★ **MathType 3.0, Design 5cience, 310/433-0685, $199.** This equation-writing software makes automatic typographical decisions, which is helpful if you produce documents on a wide range of subjects. Its smooth integration with Microsoft Word is also convenient. Mar 93

★★★★ **5equencher 2.0 (2.0.8), Gene Codes Corp., 313/769-7249, $2200.** While not implementing everything a DNA researcher could want, this software for manipulating DNA-sequence information does provide the things a researcher really needs. The single best feature is its raw speed. Dec 92

★★★ **5imulink 1.2, The MathWorks, 508/653-1415, $3995.** If you hear the word *Bode-plot* several times a week at work, this math-simulation software is designed to make your life wonderful. Little glitches and a command-line orientation are drawbacks. Dec 92

★★★★ **5pyglass Dicer 2.0, 5pyglass, 217/355-6000, $695.** Scientific 3-D visualization tool displays a two-dimensional slice through a three-dimensional object (which is represented in the computer by a data table). While Dicer pushes the limits of the Mac hardware, for its function this product is really the only game in town. Jul 93

★★★ **5pyglass Transform 3.0, 5pyglass, 217/355-6000, $595.** Scientific-visualization software can access data stored in every common format, offers some useful presentation-graphics features, and includes a programming language with a large range of built-in, high-level scientific functions. Sep 93

★★★ **5tatView 4.0m, Abacus Concepts, 510/540-1949, $595.** A nice mix of statistical prowess and operating convenience distinguish this statistical-analysis and presentation software. The printing options are outstanding. Nov 92

★★★★ **5tatView 4.01, Abacus Concepts, 510/540-1949, $595.** If your work uses statistics for decision support rather than abstract analysis, and you regularly have to present your results to nonstatisticians, this is the statistics package for you. Oct 93

★★★ **5um Total 1.01, Concurrent Engineering Tools, 602/464-8208, $99.95.** Exceptionally rich calculator utility is packed with advanced features, including an unusual mode that lets you sample colors and use the numerical color values in calculations. The convenient palette approach causes a distinct time-lag in menu operations. Oct 93

★★★★ **Theorist 1.5, Prescience Corp., 415/543-2252, $449.95.** Symbolic-mathematics program that you can figure out by yourself adds a useful table feature, more special functions of physics, and better graphics. Plus, it's still the only program to use real notation directly. May 93

★★★★★ **Voyager II, Carina Software, 510/352-7328, $159.95.** If a brilliantly-lit, star-filled sky holds more than a moment's fascination for you, you need to know about this astronomy program. In a firmament of mostly faint and forgettable astronomy software, it's a supernova. Jul 93

ORGANIZATION/PRODUCTIVITY

★★★ **Achieving Your Career 1.02, Up 5oftware, 415/921-4691, $69.** HyperCard-based job-search software succeeds by compactly organizing. It provides a structure for identifying letters to write, phone calls to make, and interviews to follow up. Aug 93

★★ **ACT 1.0 (1.01), Contact 5oftware International, 214/919-9500, $395.** While this contact manager has several laudable features, such as customizable contact views and an integrated word processor, learning how to use it is a frustrating experience. Feb 93

★★★★ **CalendarMaker 4.0, CE 5oftware, 515/224-1995, $59.95.** Polished, intuitive calendar-making program is straightforward, with a variety of options for customizing your calendar. Some features can be cumbersome. Oct 93

★★ **ClienTrac 1.7.1, Whiskey Hill 5oftware, 415/851-8702, $135.** Easy-to-use, HyperCard-based contact-management software performs as billed, but fails to inspire much enthusiasm. Aug 93

★★ **Connections 2.1, Heizer 5oftware, 510/943-7667, $199.** A wider range of scheduling features, new printing options, and improved networking capabilities don't change the fact that this HyperCard-based personal information manager is just too slow. Nov 92

★★★ **Contact Ease 2.0.1, WestWare, 619/660-0356, $395 to $1495.** Contact-management and sales-automation software helps salespeople keep in touch with contacts, makes it easy to generate letters, and maintains detailed records of activities. It has a few quirks but is overall a good program. Aug 93

★★★★ **DateBook 1.5.1 (1.5.li), After Hours Software, 818/780-2220, $125.** Personal time manager offers a flexible approach to event scheduling and to-do-list management. This upgrade adds new features and fixes bugs that plagued the first version. Feb 93

★★★★ **DayMaker 2.0 (2.03), Pastel Development Corp., 212/941-7500, $129.95.** If you need to organize lots of disparate information, follow up on meetings with many people, create an archive of completed work, and print out lists of to-do items, this free-form personal information manager is a great choice. May 93

★★★ **Dynodex 3.0, Portfolio Software, 408/252-0420, $89.95.** The speed and printing options of this field-based address-book manager are its strengths, but this upgrade adds welcome improvements to the interface, including automatic formatting of phone numbers. Apr 93

★★★ **EasyAlarms 2.0.3 (2.1), Essential Software, 619/481-1477, $99.** Complex, flexible calendar, reminder, and to-do list program includes scripting and sound recording among many other features. Nov 92

★★ **Hello, Atelier 5ystems, 619/453-4300, $99.** Unusual combination of contact management and word processing in a compact package. This first release is hampered by several notable flaws, such as text documents that must be linked to a contact name. Jan 93

★★★★ **In Control 2.0, Attain Corp., 617/776-1110, $129.95.** The best features of an outlining program are combined with those of a database, making it easy to sort, search, organize, and print your to-do list. Aug 93

★★★★ **Inspiration 4.0, Inspiration 5oftware, 503/245-9011, $295.** Watch your ideas evolve in a dynamic diagram mode and a text-based outline mode with this brainstorming tool. It works best as a vehicle for organizing and developing ideas. Feb 93

★★★ **Intouch 2.0.4, Advanced Software, 408/733-0745, $99.95.** Free-form database is a fast and easy way to manage contact information. Program offers flexible data entry instead of automatic formatting. Although this version adds a handy reminder system, it falls short as a calendar planner. Feb 93

★★★ **LapTrack For the Mac 1.0b, Timeslips Corp., 508/768-6100, $79.95.** Time- and expense-tracking program offers the right features for the on-the-go professional, but the interface is overcomplicated and the documentation is sloppy. Still, in spite of its flaws, it does an excellent job. May 93

★★★ **Nolo's Personal RecordKeeper 3.0, Nolo Press, 510/549-1976, $34.96.** Hierarchically configured database organizes your personal affairs, including legal matters, financial records, insurance plans, family history, and more, but it is frustratingly inflexible. Jan 93

★★★★ **Now Up-to-Date 2.0, Now Software, 503/274-2800, $99 to $799.** Calendar utility combines flexibility, ease-of-use, and streamlined operations in an almost irresistible package. The Reminder control panel,

while a great new feature, has had minor conflicts. Jun 93

★★★ **Office Manager 2.1 (2.5), White Crow Software, 800/424-0310, $99.** Simple contact- and project-management software is powerful for small databases, but reliance on HyperCard limits its usefulness for low-end Macs. Dec 92

★★★ **Power Team 1.0, ProVue Development Corp., 714/892-8199, $149.95.** Personal information manager consists of seven modules: Phone Book, Calendar, Correspondence, Checkbook, Calculator, Expense Report, and Mailing List. It has some bugs, but the data entry features are excellent. Oct 93

★★★★ **Spiral 1.0 (1.02), Technology Works, 512/794-8533, $129.** Designed specifically for taking and organizing notes, this product provides an excellent feature set, including bookmarks and an option for automatically expanding abbreviations, but it's marred by some errors in the editing and import/export processes. Mar 93

★★ **TimeVision 1.0, Powercore, 815/468-3737, $99.** New scheduler with notepad and card-file functions tacked on has some worthwhile features, but in general doesn't match up to the competition. May 93

PRESENTATION TOOLS

★★★★ **Action 1.0 (1.02), Macromedia, 415/252-2000, $495.** Entry-level multimedia integration program offers, for its price, a rich selection of features, including a variety of transitions as well as gradient and patterned backgrounds. It makes producing presentations with sound and motion surprisingly easy. Feb 93

★★★★ **Adobe Premiere 2.0 (2.0.1), Adobe Systems, 415/961-4400, $695.** A dream command post for video professionals, this QuickTime movie-editing software produces stunning special effects with little effort. Only the program's appetite for memory, disk space, and computer horsepower prevent it from being the nonprofessional's dream as well. Jan 93

★★ **Comet CG 1.0.3, MSI, 317/842-5097, $995.** Program for generating antialiased text over live video is reasonably priced compared with dedicated graphics systems, but you're likely to be as astonished by its limitations as you are impressed by its capabilities. It offers too few formatting options, a cumbersome interface, and an insubstantial manual. May 93

★★★★ **CoSA After Effects 1.1, CoSA, 401/831-2672, $1295.** QuickTime movie editor blurs the boundaries between animation and traditional video-editing. It yields at least as many *oohs* and *ahs* as it does irritations, and it produces results that simply can't be created in other packages. Oct 93

★★★ **DiVA VideoShop 1.0, DiVA Corp., 617/491-4147, $599.** Instantaneous playback sets this graceful QuickTime editing software apart. Its simple beauty is slightly offset by a few rough edges, a lousy manual, and an occasionally clumsy interface. Jul 92

★★★ **Hi Rez Audio Volume 1.0, Presto Studios, 619/689-4895, $149.95.** The enjoyable, high-quality music on this CD-ROM adds a nice touch to presentations. The software for browsing the music is quirky, and the product could use some documentation. Jul 93

★★★ **Interactive Training for Director 1.1, Media In Motion, 415/621-0707, $199.** This somewhat expensive program teaches basic Macromedia Director skills and provides a foundation for exploring Director's other features. It has a clear, often lighthearted approach, but navigating the lessons can be frustrating. Jun 93

★★★ **Macromedia Director 3.1 (3.1.1), Macromedia, 415/252-2000, $1195.** This minor update to a powerful and versatile multimedia authoring tool adds 23 scripting commands, QuickTime importing and editing, and a utility that compiles movies into a faster playback format—but the whopping $149 addition to the price makes it an upgrade most users can afford to miss. Feb 93

★★★ **Media-Pedia Video Clips, Media-Pedia, 617/235-5617, $195 to $495.** Fifty-seven minutes of stock footage for use in QuickTime movies includes over 150 different segments, ranging from unremarkable to dramatic to genuinely funny. Apr 93

★★★★ **Microsoft PowerPoint 3.0, Microsoft, 206/882-8080, $495.** This remarkable upgrade puts this presentation program ahead of the pack in terms of convenience and ease of use. Although the ready-made template collection is pretty paltry, the extensive system of master layers, reliable cross-platform compatibility, and strong on-screen presentation capabilities more than compensate. Feb 93

★★★ **Morph 1.0 (1.1), Gryphon Software Corp., 619/454-6836, $149.** With patience and practice, you can become a high-tech special-effects wizard using this image-melding movie utility that "melts" one image into another. While using it is simplicity itself, you can only morph still images, and the program suffers from some first-release glitches. Nov 92

★★ **Motion Works ProMotion 1.0 (1.03), Motion Works, 604/685-9975, $395.** Inexpensive animation program consolidates a slew of tempting features, including flexible path tools and ambitious support for Apple events, but the capabilities are strung together with a weak and problem-ridden interface. Nov 92

★★ **MovieWorks 1.1, Interactive Solutions, 415/377-0136, $395.** Over 100 bugs were fixed in version 1.1 of this multimedia authoring software that takes an all-in-one approach to creating presentations, but problems remain. It's a good idea, poorly executed. Jun 93

★★★ **Passport Producer 1.0, Passport Designs, 415/726-0280, $495.** Strong timing controls and good sound capabilities mix with middling text- and image-handling and a lack of even basic animation options in this partially successful entry-level multimedia program. Apr 93

★★★ **Special Delivery 1.0 (1.1), Interactive Media Corp., 415/948-0745, $399.** While this entry-level multimedia package has all the tools you need to assemble interactive screen presentations that burst with motion and sound, it has a disorienting interface and lacks the polish and power of other similarly priced programs. Mar 93

★★★ **VideoFusion 1.0.1, VideoFusion, 419/891-1090, $649.** Collection of special effects for QuickTime movies may not be for the casual user, but if you have the equipment and you can't live without spinning logos and superimposed shots, then go ahead and indulge. Jul 93

★★★★ **Working Model 1.0, Knowledge Revolution, 415/553-8153, $995.** Animators and engineers will love this terrific motion simulator that mimics real motion by applying physical laws to objects. It's easy to learn and use, but you'll need some understanding of math and physics. Oct 93

PROGRAMMING

★★★ **CLImate 1.0, Orchard Software, 617/876-4608, $59.95.** With a little more documentation and a few more sample programs, this utility that provides a subset of Unix-like commands for the Mac environment could be an irresistable package. Oct 93

★★★ **EdScheme 3.4 (4.0), Schemers, 305/776-7376, $49.95.** This clear, elegant programming language is an excellent tool for learning good programming techniques, although it can't be used to create stand-alone applications. Nov 92

★★★ **EISToolKit 2.0, MicroStrategy, 302/427-8800, $1995.** Reliable, field-tested developer's environment for creating executive information systems provides automatic access to information in spreadsheets and databases across a distributed system, and serves up the information on screens that provide automatic graphing, analysis, and report generation. May 93

★★★★ **FutureBASIC 1.0, Zedcor, 602/881-8101, $299.95.** Complete, easy-to-learn, real-world programming tool has full Toolbox, System 7, and assembler support. It's a wonderful tool that's rapidly becoming a favorite among commercial developers. Jul 93

★★★ **Macintosh Common Lisp 2.0, APDA, 716/871-6555, $495.** Anyone who likes programming in the dynamic language of LISP will be pleased with the environment provided by this version of the standard dialect and its extensive debugging and interface-building facilities. Oct 93

★★★ **MetaDesign for the Macintosh 3.0, Meta Software Corp., 617/576-6920, $250.** This diagramming tool for structured systems analysis offers easy ways to group and ungroup symbols in diagrams and to show relationships between symbols. It excels at austere, classic flowcharts but could use some flashier features, such as shaded backgrounds, for presentations. Mar 93

★★★ **Object Logo Student Edition, Paradigm Software, 617/576-7675, $49.95.** This book-plus-disk package offers a wide-ranging introduction to programming concepts. It's aimed roughly at the high-school educational level and lets you see something happen for every few lines of code you type. Jul 93

★★★★ **Object Master 1.0.2, ACI US, 408/252-4444, $395.** Successful combination of the superior object-management facilities typically found in Smalltalk, and a first-rate programmer's editor. Plus it works with the most popular languages: C, C++, and Pascal. Jan 93

★★★★ **PG:Pro 1.5, Staz Software, 601/225-7085, $169.** For part-time or novice programmers, the combination of these BASIC programming tools and FutureBASIC is a fast path to a working program. Jul 93

★★★ **PowerPacks 2.0, NDG Phoenix, 301/718-8880, $225.** Programmers' tool kit for 4th Dimension provides 280 external procedures to improve custom applications and exploit System 7 features. Don't expect any quick fixes for 4D's less-than-blistering performance in most areas, though. Oct 93

★★★ **Serius Programmer 3.0, Serius Corp., 801/261-7900, $395.** The graphical interface of this application-design environment provides nonprogrammers with tools for creating custom software, but the documentation lacks critical explanations. Jan 93

★★★ **SoftPolish 1.1, Language Systems Corp.,**

continues

MACWORLD Star Ratings

703/478-0181, $295. Program-quality-assurance utility systematically checks the resources in a program's interface against a huge laundry list of errors. It's a programming tool for anyone who hopes to produce a commercial Mac application. Sep 93

★★★ **5ource5afe 2.1, One Tree 5oftware, 919/821-2300, $295 to $1195.** Solid, relatively easy-to-use product handles program-development administrative tasks, including version control, for multiplatform programs being created by groups. Sep 93

★★★★ **Think C 5.0, 5ymantec Corp., 408/253-9600, $299.** While not a radical improvement, this is a significant upgrade to an outstanding development tool. Beginners won't find the documentation helpful. Jul 92

★★★★★ **Think Pascal 4.0, 5ymantec Corp., 408/252-3570, $249.** A remarkable achievement—a programming language and environment full-bodied enough for professional programmers while still inviting for neophytes. No weak points and dozens of strengths. Aug 92

UTILITIES

★★★ **7th Heaven 2.5, Logical 5olutions, 612/659-2495, $99.95.** Our reviewer found the seven enhancements to System 7 fun and elegantly done, but not all of them were useful. Jul 93

★★★ **Alki 5eek 2.1, Alki Software Corp., 206/286-2600, $39.95.** Competent file-finding utility scans by file name or content and lets you combine multiple search criteria. It cannot search in the background or find text in compressed files. Jul 93

★★★★ **At Ease 1.0 (1.1), Apple Computer, 408/996-1010, $59.** Sweet, simple, secure substitute for the Finder displays a clean, attractive page full of oversize icons where a single click launches a program or document. To delete, rename, or move files, you have to return to the Finder. Mar 93

★★★ **AutoDoubler 1.0.7 (2.0.1), 5alient 5oftware, 415/321-5375, $89.95.** Designed to operate transparently, this automatic file-compression utility is a practical solution for users short on disk space, but it's missing many of the features of dedicated file-compression utilities. Sep 92

★★★ **Billy Steinberg's PBTools 1.0.1, Inline Design, 203/435-4995, $99.95.** If you want basic PowerBook management without added frills or complex menu bar displays, this collection of four utilities may be just your cup of tea. Jul 93

★★★ **Chameleon 2.0.3, Logical Solutions, 612/659-2495, $59.95.** Sleek and simple desktop-pattern editor comes with an ample supply of rich, textured color images and a set of limited but functional editing tools. Sep 93

★★★★ **ClickChange 2.0, Dubl-Click Software, 818/888-2068, $89.95.** Interface-customizing package has nothing you need but is filled with everything you want, including tools that let you alter major elements (cursors, menu bar, clock, buttons, scroll bars, windows, colors, patterns, and sounds) of the Mac's look-and-feel. Aug 93

★★★★ **Conflict Catcher and Other Innovative Utilities 1.0 (1.3.8), Casady & Greene, 408/484-9228, $79.95.** Enable or disable INITs and start-up items when you boot, with this INIT manager that comes with four other system-related utilities. Its ability to track down INIT-related problems makes it a worthwhile investment even if you own another INIT manager. Mar 93

★★★ **Copyright, CSG Technologies, 412/471-7170, $49.** If you can justify spending $49 purely for the sake of efficiency, this straightforward utility replaces the Finder's copy function, unobtrusively copying files to or from your Mac, in the background, while you move on to more interesting things. Apr 93

★★★★ **CPU 2.0, Connectix Corp., 415/571-5100, $99.** Reasonably priced collection of utilities for the PowerBook adds new features, including file synchronization, that easily justify the upgrade price. Sep 93

★★★ **DiskFit Direct 1.0, Dantz Development Corp., 510/849-0293, $49.95.** Basic but efficient backup system is simple and painless enough to foster better backup habits in anyone who uses it. It doesn't back up to hard drives or tape drives. May 93

★★★ **Drive 7 2.3 (2.34), Casa Blanca Works, 415/461-2227, $79.95.** Universal hard drive updater and formatter has an attractive, uncluttered interface that's so easy to use it makes hard drive maintenance almost relaxing. Jan 93

★★ **DynoPage 2.0, Portfolio 5oftware, 408/252-0420, $89.95.** While this utility greatly simplifies the printing of booklets and double-sided pages, it doesn't support PostScript graphics, is incompatible with some popular applications, and has a buggy drag-and-drop feature. Jul 93

★ **eDisk 1.0, Alysis Software Corp., 415/566-2263, $149.95.** Driver-level compression software has little to recommend it over file-level, idle-time compression programs that are generally faster, have no impact on hard drive performance, and can be installed and removed without affecting data. The biggest drawback is the strong potential for disk or file corruption. Oct 93

★★★ **Hard Disk ToolKit Personal Edition 1.1.2, FWB 5oftware, 415/474-8055, $79.** The more arcane features of the heavy-duty Hard Disk ToolKit have been stripped out of this entry-level, non-power-user version, but everything you really need to format, update, partition, and manage your hard drive is included. Jan 93

★★★ **I Like Icon, Baseline Publishing, 901/682-9676, $59.95.** Glitzy utility has tools for icon editing, has an impressive library of icons, and can create animated icons. Some basic features, such as a text tool, are missing, and the animated icons are fun but impractical. Sep 93

★★★ **Icon 7, Inline Design, 203/435-4995, $79.95.** Simple, straightforward utility has a streamlined and intuitive library feature for storing and retrieving icons, plus tools for icon editing. Its icon collection, however, is pretty paltry. Sep 93

★★★ **INITPicker 3.0 (3.02), Inline Design, 203/435-4995, $79.95.** This INIT manager's ability to load aliased INITs over a network will interest network managers. While it disables problem INITs at start-up, it doesn't help you identify the cause of INIT conflicts that don't cause the Mac to crash at start-up. Mar 93

★★★★ **Inline 5ync 1.0 (1.01), Inline Design, 203/435-4995, $129.95.** Keep the latest version of your work on your portable machine and your desktop Mac with this file-synch software. It's easy to install, easy to use, easy on the wallet, and does the job well. Mar 93

★★★★ **KidDesk 1.0, Edmark Corp., 206/556-8484, $39.95.** If you have young children who love to experiment with your Mac while you're busy elsewhere, this desktop environment is a fun way to provide easily navigable play while protecting your files and applications from the havoc that curious little fingers can wreak. Jun 93

★★★★ **Kiwi Power Menus 1.0, Kiwi 5oftware, 805/685-4031, $39.95.** Simple little utility adds flexibility to the Apple menu by adding an unlimited number of submenus and enabling you to change the font and size in the menus. Dec 92

★★ **Magic Typist 2.0, Olduvai Corp., 305/670-1112, $129.** If you want to speed up typing of repetitive phrases or if you don't have full use of your hands, this utility, which automates typing of repetitive phrases, may be useful; but some functions work erratically or not at all in Microsoft Word. Sep 93

★★★★ **Magnet 1.0 (1.01), No Hands Software, 415/321-7340, $129.95.** Automation aids the laborious task of file management with this software. It creates "agents" or "magnets" that trigger in response to user-specified events and automatically look for files and folders to copy, move, or alias. Feb 93

★★★★ **MasterFinder 1.2.1, Olduvai Corp., 305/670-1112, $149.** Ingenious finder utility provides rapid access to frequently used files and folders, permits operations on several files at once, and saves catalogs of offline volumes, but the many features require some effort to learn. Nov 92

★★★ **More Disk 5pace 1.1 (2.1), Alysis Software Corp., 415/566-2263, $99.95.** Automatically compress and expand files with this utility. Although it doesn't identify compressed files, and must run as a start-up application to work automatically, it does offer a measure of control that similar utilities lack. Sep 92

★★★ **NightWatch II 2.0.1b (2.01c), Kent Marsh, 713/522-5625, $159.95.** Although skillful snoops can override the screen-locker feature of this hard drive security utility, the password protection provides a flexible and safe method of restricting access to anyone turning on your hard drive. Nov 92

★★★ **Norton Essentials for PowerBook 1.0, Symantec Corp., 310/453-4600, $129.** Uneven collection of a dozen PowerBook utilities ranges from the unique and useful Instant Access module, which automatically turns AppleTalk on and off, to the relatively inaccurate Battery Gauge feature, which purports to tell you the status of your battery. Apr 93

★★★★ **Now Utilities 4.0.1, Now Software, 503/274-2800, $129.** Many thoughtful improvements have been added to this collection of utilities, which is now better integrated, more logically designed, and still an excellent deal for your dollar. The new scrapbook feature, however, is awkward and inconvenient. Aug 93

★★★ **Peace of Mind 1.2.2, Polybus Systems Corp., 716/871-6533, $149.** Hardware diagnostic tool performs exhaustive batch, interactive, and benchmark tests on virtually all major Mac hardware components; does an excellent job of diagnosing simple simulated hardware errors (such as SIMM tweaking). The program has minor bugs and lacks a comparative test-history feature. Jun 93

★★★★ **PicturePress 2.5, Storm Technology, 415/691-6600, $199.** This image-compression software supports every useful storage mode; has new calculation features for improved image fidelity; offers utilities with practical advantages for day-to-day graphics work; and is twice as fast as version 2.0. If you work with images professionally, it's the clear choice. Mar 93

★★★ **PowerMerge 1.0.2, Leader Technologies, 714/757-1787, $129.** File-synchronization utility has a potentially confusing interface, but is a handy means of updating selected files so that different Macs end up with identical versions of the selected documents. Apr 93

★★★ **Public Utilities for the Macintosh 1.0, Fifth Generation Systems, 504/291-7221, $149.** Utility program sticks to the basics of disk diagnosis, disk repair, and file optimization. It does a good, and in some cases unique, job, although disk optimization is slow. Fifth Generation's technical support is excellent. Jun 93

★★★ **RapidTrak 1.0.1, Insignia Solutions, 415/694-7600, $99.95.** If you've got RAM to spare, this hard drive formatter offers driver-level RAM caching to store frequently used data and improve performance, especially on slower-speed drives. May 93

★★★ **Retrieve It 1.0, Claris Clear Choice, 408/987-7000, $49.** It's great that this nonindexed file-finding utility allows you to search by file name as well as by text, but it is definitely slower than indexed searching. Nov 92

★★★★ **Retrospect 2.0, Dantz Development Corp., 510/849-0293, $249.** Powerful backup and archiving software has an improved interface and scripting capabilities, and works well for all levels of users. Sep 93

★★★★ **Retrospect Remote 2.0, Dantz Development Corp., 510/849-0293, $449.** Utility allows fast, automatic backup of networked Macs to a central Mac with a backup device. It worked flawlessly in our reviewer's tests. Sep 93

★★★ **Safe and Sound, Central Point Software, 503/690-8090, $49.95.** Limited but useful disk-protection and -salvage utility has a clean, simple interface and is an efficient emergency recovery tool. Jun 93

★★ **Safe or Sorry 1.0, Olduvai Corp., 305/670-1112, $59.** Unobtrusive control panel periodically saves all of your keystrokes, but requires System 7.1 and offers no clear-cut advantages when compared with other text-recovery programs. Oct 93

★★ **SafeDeposit 1.2, Dayna Communications, 801/269-7200, $189.** Automated backup program is easy to set up but slow. Also, unattended backups must be restarted from scratch if disk space runs short and a new disk isn't inserted. Sep 93

★★★ **Silverlining 5.4, La Cie, 800/999-3919, $149.** Extensive and detailed testing is only one of many advanced functions offered by this hard drive–management utility. The interface is lackluster and apt to confuse beginners. Jan 93

★★★★ **SnapBack 1.0, Golden Triangle Computers, 619/279-2100, $129.** For regular day-to-day backups, this network backup software is a great choice. Its strength lies in its simplicity and its easy-to-use, one-window interface, but it requires a dedicated hard drive. Dec 92

★★★ **SpeedyCD 1.2.2 (1.2.4), ShirtPocket Software, 602/966-7667, $70.** Get Info gets faster with this CD-ROM–access accelerator that creates a database of files from a CD and puts it on your hard drive. If you regularly browse through the same CD-ROM folders, this product might save you enough time for it to be worth the $70. Nov 92

★★★ **Square One 1.5.2, Binary Software, 310/582-8293, $74.** Flexible, attractive icon-based file launcher provides infinitely customizable palettes, including one that displays active applications. The manual could use some help, and the application will consume 400K of your system memory. Aug 93

★★ **Stacker for the Macintosh 1.0.1, Stac Electronics, 619/431-7474, $149.** As long as you pay attention to the capacity of your hard drive, this driver-level compression product performs reasonably well, except for its slow hard drive read quotient. Oct 93

★★★★ **Star Trek: The Screen Saver, Berkeley Systems, 510/540-5535, $59.95.** Go where no Mac has gone before with this screen saver based on the original "Star Trek." Modules vary from simple messages in "Trek"-inspired fonts to an endless parade across the ship's main screen of aliens, spacecraft, and artifacts from different episodes. May 93

★★★★ **Star Wars Visual Clips, Sound Source Unlimited, 805/494-9996, $89.95.** Control panel lets you play QuickTime movie clips from *Star Wars* at system events. If you have the money, the hard drive space, and the RAM, this is the kind of totally cool toy that will make you remember why you love your Mac. Sep 93

★★★★ **StuffIt Deluxe with SpaceSaver 3.0, Aladdin Systems, 408/761-6200, $120.** Its many conversion tools, able feature set, automatic compression capabilities, reliability checks, and acceptable performance make this product the jack-of-all-trades of compression utilities. Aug 93

★★★ **Super 7 Utilities, Atticus Software, 203/324-1142, $99.95.** Collection of seven control panels/extensions adds some ease of use to System 7, although none of its functions are essential. Modules perform tricks such as turning any menu into a tear-off palette, and randomizing the sounds that play in response to errors. Apr 93

★★ **SuperDuper 1.7, NeoConcepts, 408/899-4821, $79.** If you're sick of duplicating disks with the Finder, this utility is an acceptable alternative, but there are other utilities that are better, cheaper, and do the same thing. Nov 92

★★ **TimesTwo 1.0.1, Golden Triangle Computers, 619/279-2100, $149.** Automatic disk-compression utility operates at the disk-driver level rather than as an operating system add-on. A number of quirks, such as its ungraceful handling of full disks, are problems. May 93

★★★★ **UpDiff 1.0, KyZen Corp., 609/354-3863, $169.** Innovative program compares two versions of a file, extracts the differences, and creates a difference file that is typically smaller than the original and can be used to update the older file. Dec 92

★★★ **Virtual 3.0.1, Connectix Corp., 415/571-5100, $99.** If you need to eke out as much virtual memory speed as possible, this utility may be a useful tool. For System 6 users who want virtual memory, it's the only game in town. Sep 93

★★★ **Voice Navigator SW 2.3, Articulate Systems, 617/935-5656, $399.** Talk back to your Mac (if it has built-in sound input) with this speech-recognition software. Defining macros that respond to voice commands can be frustrating, but the product is a real boon for disabled users. Jan 93

★★★ **WonderPrint 1.0, Delta Tao Software, 408/730-9336, $59.** StyleWriters and DeskWriters produce halftones good enough for newsletters with this printing extension that improves the output of QuickDraw printers and accelerates printing of pictures on PostScript printers. Jan 93

VERTICAL MARKETS

★★★ **Compare-A-Loan 4.0.2 (4.1), Softflair, 612/894-3357, $79.95.** Although geared to professionals, this product for home-loan evaluation provides thorough documentation and is structured so that anyone can use it. Its reports compare payback schedules of various home-loan options. Apr 93

★★★★ **Diet Balancer 1.0 (1.05), Nutridata Software Corp., 914/298-1308, $69.95.** Easy-to-use personalized weight-planning tool includes a database of nutritional values and standard serving sizes, and is useful for home diet-planning. Dec 92

★★★ **Expert Home Design 1.0 (1.0.3), Expert Software, 305/567-9990, $49.95.** Quickly and easily create home- or office-interior layouts that are precise, but not as detailed as blueprints, with this interior design software that includes a large furniture library. It doesn't do automatic side views, or offer *⌘-key* access to library objects, but it's a good value nonetheless. May 93

★★ **Expert Landscape Design 1.0 (1.0.2), Expert Software, 305/567-9990, $49.95.** Barebones drawing environment for experimenting with landscape design is inexpensive, but its usefulness is severely limited because of awkward color and pattern tools and because it doesn't identify plant types. Feb 93

★★★★ **Grade Machine 5.0, Misty City Software, 800/795-0049, $79.** Teachers' lives get easier with this software that quickly sets up a useful electronic grade book. Program includes networking capabilities plus dozens of options for printing reports. Dec 92

★★★ **JobTracker 2.02 (2.5), InfoSolutions, 814/355-2983, $395 to $844.** Designed specifically for publication management, this scheduling and project-management software isn't completely polished, but it manages the job competently. Dec 92

★★★ **LoanLease Library 3.0.3 (3.05), Softflair, 612/894-3357, $99.95.** If you are generating a loan or a lease and need to keep track of payments, this well-documented program for loan evaluation is a worthwhile investment, despite its minor eccentricities. Apr 93

★★★ **Making the Grade 2.0 (2.2), Jay Klein Productions, 719/591-9815, $99.95.** The Macintosh version of the Apple II program Grade Busters 1/2/3, this grade-book software is easy to learn; but if you're already spreadsheet-literate, the friendly dialog boxes and reminders may get in the way. Dec 92

★★★★ **Musicshop 1.0, Opcode Systems, 415/856-3333, $149.95.** MIDI sequencer is an excellent choice as a first sequencer at a bargain price. It's powerful enough to satisfy the needs of all but the most intrepid MIDI users. Oct 93

★★★ **Nutri-Calc Plus 1.2, Camde Corp., 602/926-2632, $159.** Designed for knowledgeable and serious users, this powerful, flexible program manages nutrition information and analyzes diets. Dec 92

★★★ **Roll Call 2.0, By the Numbers, 603/927-4508, $495.** 4th Dimension database application for church management helps track donations, attendance, church-group membership, and visitation. While not a complete church-management system, it's an acceptable complement to a general accounting program. Aug 93

★★★ **Stat-Ref 3.2a (3.2b), Teton Data Systems, 307/733-5494, $95.** Medical database on

continues

MACWORLD Star Ratings

CD-ROM lets you search by keyword. Because it provides access to limited sets of journal citations, it's not suitable for research, but it could effectively replace a small reference library in an office. Jan 93

WRITING TOOLS

★★★ **DocuComp II 1.0 (1.05), Advanced Software, 408/733-0745, $179.95.** Document-management utility compares text in two versions of the same file and reports the differences in a comprehensive, easy-to-follow format. Nov 92

★★★★ **Final Draft 2.0 (2.0.3), MacToolkit, 310/395-4242, $349.** Script-writing gets simpler with this well-conceived software that automates formatting of different elements in a script. Customization is easy, and macros automate typing of common phrases such as "fade to black." Apr 93

★★★ **IdeaFisher 2.0, Fisher Idea Systems, 714/474-8111, $595.** Inspiration never comes easily, but this creativity tool with a question bank of 6000 questions and an idea bank of 61,000 words and 700,000 links might help get the juices flowing. Jan 93

★★★ **Just Joking 1.0, WordStar International, 415/382-8000, $49.** HyperCard stack of around 2800 humorous quotations offers a serviceable selection of sayings from a diverse group of humorists, comedians, philosophers, and writers, among others. Apr 93

★★★ **LetterPerfect for Macintosh 2.1, WordPerfect Corp., 801/225-5000, $149.** Stripped-down version of WordPerfect measures up as a serviceable low-end word processor, with clean, accurate documentation and an uncluttered interface. Jan 93

★★★★ **MacWrite Pro, Claris Corp., 408/987-7000, $249.** Many of the new features of this upgrade are very well executed, including the easy-to-use table feature, simple but elegant palettes, and an almost pain-free mail merge feature. The program could still use some polish, however. Jul 93

★★ **MasterWord 5.1, Alki Software Corp., 206/286-2600, $99.95.** The centerpiece of this package of add-on Microsoft Word commands is a set of customizable tool bars that are obviously the product of a lot of thought and effort. Unfortunately, rough edges remain, including inaccuracies in the documentation and some features that don't work as advertised. Aug 93

★★★★ **Microsoft Word 5.1, Microsoft, 206/882-8080, $495.** Small, solid upgrade fine-tunes some plug-in modules and adds new modules including an icon tool bar, text annotation, and other features. The numerous minor enhancements make it worth the upgrade price, but it won't give Word 5.0 users goosebumps. Mar 93

★★★ **RightWriter for the Mac 5.0, Que Software, 317/573-2500, $99.95.** Grammar checker looks at writing style, word usage, punctuation, and capitalization, as well as grammar. Customizable writing-style filters and multiple approaches to analysis are nice, but—as with all grammar checkers—not all of the program's advice is great. May 93

★★★ **Showscape 4.1, Lake Compuframes, 914/941-1998, $429 to $679.** This script-writing software formats scripts in either screenplay format or dual-column format (for audio and video) and allows you to choose the number of shots displayed per page, but it requires you to own and work in WordPerfect. Apr 93

★★★ **Spelling Coach Professional 4.0.1, Deneba Software, 305/596-5644, $195.** If you're considering investing in reference software, this spelling checker, dictionary, and thesaurus is a relatively capable, if expensive, alternative. Oct 93

★★★ **TypeReader 1.0, ExperVision, 408/428-9988, $695.** Speed and accuracy combine with a straightforward operating style in this high-end OCR software that doesn't do everything its competition does, but is a major contender nonetheless. Feb 93

★★★ **VersionMaster 1.5, A5tar Technologies, 508/486-8532, $199.95 to $1199.95.** Document-management utility helps you archive and track versions of a file by maintaining a database of altered documents. It's recommended only for workgroups that routinely follow check-out procedures and that don't need detailed reports of the changes to a file. Apr 93

★★★ **WordPerfect for Macintosh 2.1 (2.1.3), WordPerfect Corp., 801/225-5000, $495.** Play QuickTime movies in your text files or publish and subscribe with this upgrade. It continues to provide the best desktop publishing and graphics capabilities of any word processor, but it lacks glossary- and table-creation features. Jun 92

★★★★ **WriteNow 3.0, WordStar International, 415/382-8000, $119.** The streamlined approach of this low-end word processor will appeal to many Macintosh users, especially the storage-conscious. A nice mix of features includes impressive implementation of style sheets. Sep 92

Hardware

INPUT DEVICES

★★ **Apple Adjustable Keyboard, Apple Computer, 408/996-1010, $219.** Adjustable keyboard is a slight improvement on the flat slab keyboard, but hopefully it won't be the last. Theoretically, it corrects a crook in the wrist known as ulnar deviation, but many sufferers of repetitive stress injuries are still hoping for a keyboard that adjusts on a vertical plane. Jul 93

★★★★ **ArtZ ADB Tablet, Wacom Technology Corp., 206/750-8882, $449.** Combining pressure-sensitive operation, manageable size, and a new pencil-thin stylus, this affordable digitizing tablet is perfect for artists looking for traditional-style control of their graphics programs. Aug 93

★★★ **Computer Crayon, Appoint, 510/463-3003, $49.** The kid contingent's verdict was a definite thumbs-up on this brightly colored input device that's shaped like a thick pencil. The buttons can be hard for smaller children to press, and serious computer artists should still opt for a drawing tablet. Oct 93

★★ **Gulliver, Appoint, 510/463-3003, $119.** This diminutive mouse is hard to hold comfortably for an extended period, but it works well on almost any surface, including fabric, wood, plastic, and paper, making it an acceptable alternative for PowerBook users. Oct 93

★★★ **Mouse-Trak, Itac Systems, 214/494-3073, $179.** Well-positioned, easy-to-rotate trackball with a soft wrist-pad is comfortable to use, but must be disassembled to reconfigure the buttons. Nov 92

★★★★ **Turbo Mouse 4.0, Kensington Microware, 415/572-2700, $169.95.** Large buttons on either side of this trackball provide just the right measure of tactile feedback; the removable ball glides freely. But the breakthrough feature is the software that lets you customize many of the trackball's functions. Nov 92

★★★ **The UnMouse, MicroTouch Systems, 508/659-9000, $199.** Input device is a cursor-control device, programmable keypad, and small graphics tablet in one, and can be programmed with 60 macros (although only 16 can be selected by sight). It's ergonomically better than a mouse, but not as good as a trackball. May 93

★★★ **Z-Nix Cordless SuperMouse, DynaPoint, 818/854-6440, $99.** Sleek and attractive cordless mouse works reliably and is attractively priced, but suffers from the same line-of-sight limitations as other infrared devices (such as TV remote controls). Dec 92

MISCELLANEOUS HARDWARE

★★★ **AC5300 Computer Speaker System, Altec Lansing Consumer Products, 717/296-4434, $400.** Clamshell-shape high/midrange speakers come with a freestanding subwoofer and power supply. The sound is rich and smooth, but the cabling is nonstandard, and there is no on/off switch. Nov 92

★★ **Address Express, Costar Corp., 203/661-9700, $795.** Flaky performance and system crashes plagued this combination hardware-and-software envelope-and-label printer in our tests, but the print quality was good. Oct 93

★★★★ **Apple Color OneScanner, Apple Computer, 408/996-1010, $1349.** Tests of this color scanner demonstrate unpolluted colors and sharp image details, perhaps due to color filters and lenses that Apple claims were specially designed and tuned for the scanner. Jul 93

★★★★ **AppleCD 300, Apple Computer, 408/996-1010, $599.** Double-speed CD-ROM drive spins its discs at twice the speed of earlier drives, providing faster access to large files. It also reads multisession Photo CDs. Jun 93

★★★ **EMBARC, Embarc Communications Services, 407/364-2000, $395 plus fees.** If you're a PowerBook user who is frequently in places with no telephone and you need timely delivery of electronic news and E-mail, this portable wireless message service may prove useful, but the cost may be prohibitive to others. Sep 93

★★★★ **Epson ES-800C, Epson America, 310/782-0770, $1499; Macintosh interface kit $399.** Flexible 400-dpi scanner offers a range of options, including one- or three-pass scanning, plus a full-featured, easy-to-use software package that includes a Photoshop plug-in, a QuarkXPress extension, and a desk accessory that lets you scan an image from the Apple menu. Aug 93

★★★★ **Media Control Station 1.0 (1.01), JLCooper Electronics, 310/306-4131, $269.95.** This versatile tool connects to the Mac through an ADB port and offers an easy and intuitive way to cue and edit QuickTime movies, MIDI files, multimedia playlists, and other dynamic data. Feb 93

★★★ **mira 35, Santos Technology, 310/320-8888, $2695.** This 35mm slide scanner puts many sophisticated color-correction tools into a low-cost package. It does have trouble resolving extremely fine details, and its color correction is RGB only. Oct 93

★★★★ **The Mouse Yoke, Colorado Spectrum,**

continues

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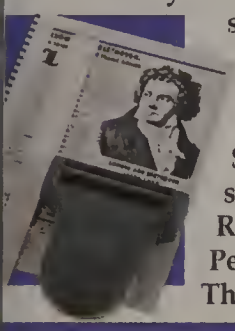

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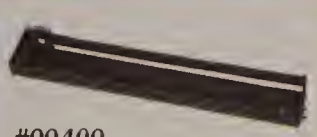

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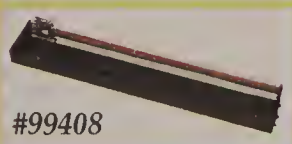

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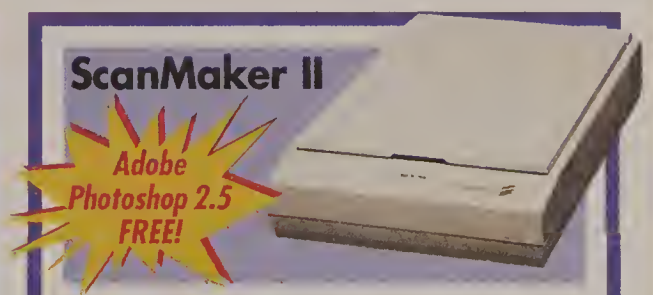

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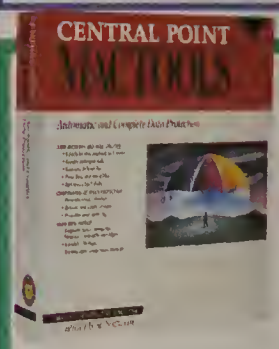

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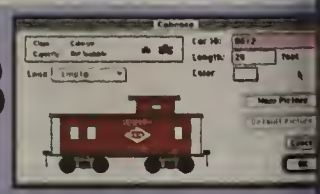

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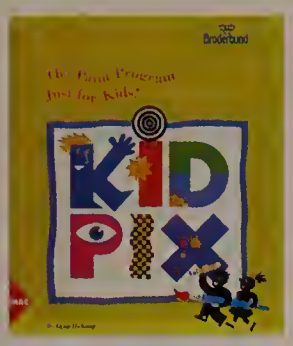

Kid Pix 1.2

Kid Pix is an amazing paint program created just for kids. It combines special effects art tools, picture stamps, sounds and more. Magic screen transformations turn the computer into a magical art studio. With Kid Pix, you don't just paint a masterpiece, you hear it too! Brøderbund *#03994*

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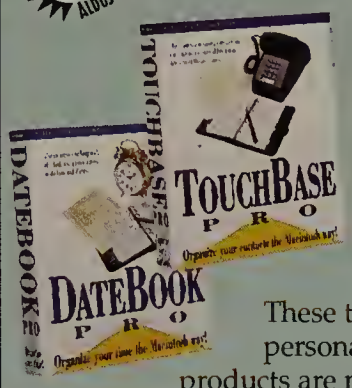

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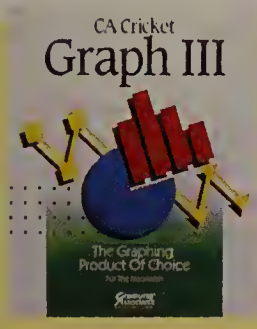

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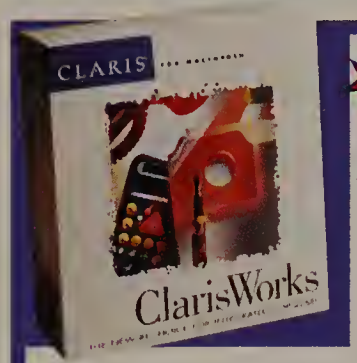

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303/225-6929, $34.95. Gadget turns an ordinary mechanical mouse into an aircraft-style steering wheel, or yoke, for use with flight simulators. Simple, elegantly executed concept uses quality materials; device is not appropriate for driving simulations or shooting games. Dec 92

★★★ **Organizer Link II (Model OZ-893), Sharp Corp., 800/321-8877, $129.99.** If you own a 5000-, 7000-, or 8000-series Sharp Wizard, this program and cable let you connect it to a Mac serial port to exchange data. It's functional, but has some minor weaknesses. Jan 93

★★★ **PhonePro 1.0.3 (1.1.5), Cypress Research Corp., 408/752-2700, $950.** Application makes it relatively easy to develop a multiple-choice voice-mail system using your Mac, especially for those with programming backgrounds. The product includes a 9600-bps modem and a headset/microphone. Feb 93

★★★★ **PowerKey 2.0 (2.01), Sophisticated Circuits, 206/485-7979, $119.** Ingenious, automated power strip has four surge-protected outlets controlled by the keyboard's on/off switch. The clever software can turn on a Mac, unattended, run a QuicKeys macro (QuicKeys Lite included), and shut down again. Dec 92

★★★ **ScanPlus Color 6000 for Mac, PlusTek USA, 408/980-1234, $749 to $899.** Small, inexpensive sheetfed color scanner is not appropriate if exact color matching is critical, but it is otherwise a good, economical option. Sep 93

★★★ **Yamaha TG100, Yamaha Corp. of America, 714/522-9011, $449.** Compact, keyboardless, multitimbral MIDI synthesizer with built-in MIDI interface adheres to the life-simplifying General MIDI standard patch arrangement. Although it won't convince you that you're hearing a live orchestra, the sound is about as realistic as low-cost MIDI gets. Apr 93

MODEMS/NETWORK HARDWARE

★★ **EtherPrint 1.0 (2.0), Dayna Communications, 801/531-0600, $499.** It's possible to connect a single LocalTalk printer to an Ethernet network using this device, but it's an expensive option. Dec 92

★★★ **EtherPrint Plus, Dayna Communications, 801/531-0600, $599.** Support four LocalTalk products on an Ethernet network using this device that can also serve as an inexpensive AppleTalk router. Dec 92

★★★★ **EtherWrite, Compatible Systems Corp., 303/444-9532, $695.** Elegant and cost-effective device with excellent network-management software allows up to six LocalTalk products to connect to an Ethernet network. Dec 92

★★★★ **PathFinder, Dayna Communications, 801/531-0600, $899.** For simple networks, this LocalTalk-to-Ethernet router is a great value, as well as a great time-saver for beginning network managers. It uses AppleTalk only. Jan 93

★★★★ **PowerPort/Gold, Global Village Communication, 415/329-0700, $499.** If you need 14,400-bps throughput, this data/fax modem is a champ. Its improved software and packaging raise the standards for PowerBook modems. Dec 92

★★★★ **Sportster 14,400 Fax/Data Modem, U.S. Robotics, 708/982-5001, $329.** Several nice features, including an easily accessible power button and a front-mounted volume-control dial, make this 100 percent Mac-ready, 14,400-bps fax/data modem better than average. Feb 93

★★ **Viva 14.4/Fax, Computer Peripherals, 805/499-5751, $299.** In data mode, this 14,400-bps fax/data modem performed well, but the software bundled with it is barely adequate. Jan 93

★★ **WorldPort 9600 MNP5, U.S. Robotics, 708/982-5001, $499.** Only slighter larger than a deck of cards, this 9600-bps modem is geared toward PC users, with a user guide that never mentions Macs and software that is only for PC compatibles. Jan 93

PRINTERS

★★★ **Apple Color Printer, Apple Computer, 408/996-1010, $2349.** If you need large-format color output, but not precision color-matching, this well-built printer is a reasonable choice, although it doesn't support PostScript. If you can do without the large-format output, you can find comparable printers at a far better price. Aug 93

★★ **C. Itoh ProWriter Printer, C-Tech Electronics, 714/833-1165, $2395.** Not only is this laser printer more expensive than most personal page printers, it also offers less-impressive features and so-so output. Nov 92

★★★★ **DEClaser 1152, Digital Equipment Corp., 508/493-5111, $999.** Four-pages-per-minute, 300-dpi, PostScript Level 2 printer offers simultaneous support for Macs and PCs, plus excellent image quality, for a ground-breaking price. The internal font set is small, and the included 2MB of memory is not enough to print complex images. May 93

★★★★ **HP LaserJet 4M, Hewlett-Packard, 800/752-0900, $2399.** An Intel i8960 RISC processor makes printing complex images faster than ever with this 600-dpi printer, while the Canon LBP-EX print engine and microfine toner guarantee smooth curves and crisp characters. An autoswitch feature makes it a flexible option for mixed-platform offices. Feb 93

★★★ **LaserWriter Pro 600 and 630, Apple Computer, 408/996-1010, $2099 to $2529.** From their paper handling to their print quality, these laser printers are Apple's best. Unfortunately, they don't support emulation-sensing, and thus may be less desirable for mixed-platform offices than other possibilities. Jun 93

★★★★ **LaserWriter Select 300, Apple Computer, 408/996-1010, $839.** Inexpensive, low-capacity printer is networkable, and an excellent buy, despite a few weaknesses. Add a 4MB SIMM to take advantage of the amazing PhotoGrade capabilities, which allow the printer to generate 91 shades of gray. Aug 93

★★ **LaserWriter Select 310, Apple Computer, 408/996-1010, $1099.** This big, slow printer is a true Adobe PostScript printer with both Mac and DOS ports, but it's not networkable or compatible with the Communications Toolbox, it can't automatically switch ports, and it doesn't have adjustable paper guides or a preview feature. Aug 93

★★★ **Phaser 200i Color Printer, Tektronix, 503/682-7377, $5995.** This thermal-wax color printer is fast and compact, with versatile paper-handling features. TekColor image-enhancement technologies provide excellent output quality that is, however, poor on letterhead and inexpensive photocopier bond. An additional $99 paper cassette is required to use plain paper. Aug 93

★★ **PrintPartner 10W, Fujitsu Computer Products, 408/432-6333, $2450.** While this multiplatform printer is fast, relatively inexpensive, and prints clearly, many Macintosh users will find it more frustration than it's worth; it can't print TrueType fonts that are not stored internally, including some that are shipped as part of System 7. Jul 93

★★★★ **StyleWriter II, Apple Computer, 408/996-1010, $359.** Apple's ink-jet printer retains the best features of its predecessor, but costs less. New features, such as gray-scale printing and the ability to share the printer over a network, make it even more versatile. Jun 93

★★★ **WideWriter, GCC Technologies, 617/275-5800, $1699.** Large-format output comes in a reasonably priced package with this ink-jet printer that can automatically feed sheets as large as 14 by 91 inches or manually feed sheets 17 inches wide with an unlimited length. Feb 93

★★★ **WriteMove II, GCC Technologies, 617/275-5800, $599.** Portable printer for the PowerBook measures 11½ by 2 by 3½ inches and weighs 2½ pounds. It's no speed demon, but it's fine for short jobs. May 93

SYSTEMS/STORAGE

★★★★ **DataPak 105, Mass Microsystems, 408/522-1200, $949 to $1049.** Well-built 105MB SyQuest drive comes with a decent, no-frills cartridge-formatting package and a copy of 7th Heaven. The preformatted cartridges have a lifetime warranty. Sep 93

★★★★ **FastCache Quadra, Daystar Digital, 404/967-2077, Quadra 950/900/700 version $449, Quadra 900/700 version $299.** PDS board provides 128K of secondary cache for a Quadra with 15ns static RAM (25ns on 900/700). The average real-world speed improvement is 15 percent, but some operations benefit more from the cache card than others. May 93

★★★★ **Infinity 105 Turbo, Peripheral Land, 510/657-2211, $795 to $894.** Small, light, quiet, inexpensive 105MB SyQuest drive is ingeniously packaged and ideal for both desktop and PowerBook use. Sep 93

★★★ **Infinity Optical 3.5, Peripheral Land, 510/657-2211, $1999.** If you need the extra measure of permanence that magneto-optical storage provides—or a compact alternative to bulky cartridges—this drive, based on a Sony mechanism and using 3½-inch disks that store 120MB of data, deserves a look. Jun 93

★★★ **Macintosh Centris 610, Apple Computer, 408/996-1010, 4/80 $1859.** Slim-design Mac uses a 20MHz 68LC040 processor at a price-to-performance ratio that comes close to competing with Windows PCs; however, its expandability is severely limited. Jun 93

★★★★ **Macintosh Centris 650, Apple Computer, 408/996-1010, 4/80 68LC040 $2699.** Moderately priced but fast 040 system offers three expansion slots and one drive bay, and (except for the base model) has built-in Ethernet, video circuitry, and a math coprocessor. This desktop Mac is as powerful as a Quadra 700 and two times as fast as a IIci. Jun 93

★★★ **Macintosh Duo Dock, Apple Computer, 408/996-1010, $1079.** Immensely clever desktop-Mac–size housing for the Duo laptops provides back-panel connectors, a SuperDrive, electrical and physical support for external monitors, and two expansion slots. Although the Duo Dock is easy to like, some details, such as the difficulty of installing NuBus boards, belie Apple's usual attention to detail. Mar 93

★★★★ **Macintosh LC III, Apple Computer, 408/996-1010, 4/80 $1349.** Base system comes equipped with a 25MHz 68030 processor, 4MB of RAM soldered to the logic board, an 80MB internal drive, and 512K of VRAM. This is a machine that fits the bill and the pocketbook of most home or small-business owners. Jul 93

★★★ **Macintosh PowerBook 145, Apple Computer, 408/996-1010, 4/40 $2149.** Adequate but essentially outdated notebook computer is an upgraded version of the discontinued PowerBook 140 with a faster 25MHz 68030 CPU, but RAM expansion is limited, and it doesn't have a built-in video port. Feb 93

★★★★ **Macintosh PowerBook 160, Apple Computer, 408/996-1010, 4/40 $2429.** A built-in video port and gray-scale capability are the new features Apple offers with this notebook computer. While it offers good processing speed and power, the passive matrix display doesn't cut it for all-day use. Feb 93

★★ **Macintosh PowerBook 165c, Apple Computer, 408/996-1010, 4/80 $3399.** The passive matrix screen of this color notebook computer is dull and has noticeable afterimages, but if your expectations are reasonable, the speedy processor provides a pleasant environment in which to work. Jul 93

★★★★ **Macintosh PowerBook 180, Apple Computer, 408/996-1010, 4/80 $4109.** An active matrix screen and a math coprocessor are the only differences between this notebook computer and the PowerBook 160, but the beautiful display is worth the extra $1000. Feb 93

★★ **Macintosh PowerBook 180c, Apple Computer, 408/996-1010, 4/80 $4169.** The active matrix screen of this color notebook computer is beautiful but so small that its usefulness is very limited. Sep 93

★★★★ **Macintosh PowerBook Duo 210 and 230, Apple Computer, 408/996-1010, 210 (4/80) $1839, 230 (4/80) $2299.** Apple's smallest computers have the pleasing heft, size, and shape of hardbound books but pack the horsepower of 030 chips. Although the screen, keyboard, and trackball (more of a "trackmarble") feel small, these computers virtually cry out to be picked up, handled, and used. Mar 93

★★★★ **Macintosh Quadra 800, Apple Computer, 408/996-1010, 8/230 $4679.** Squat, yet curvy and attractive, this minitower system has fewer expansion opportunities than the Quadra 950, but just as much power. It's fast, slick, and moderately priced. Aug 93

★★★ **MicroMac Plus Upgrade System, MicroMac, 714/362-1000, $998.** This 68030 accelerator for the Mac Plus requires disassembling a Plus and using the Plus system board to assemble the MicroMac system. It speeds up the Plus dramatically, and supports an included external full-page monochrome monitor. Jun 93

★★★★ **MultiDisk 150, Iomega, 801/778-1000, $1225.** Durable cartridges are one of the strongest reasons to choose this Bernoulli removable drive. Although it's slightly more expensive than a SyQuest drive, it's fast and reliable, and the disks are competitively priced. Jun 93

★★★ **OrangePC, Orange Micro, 714/779-2772, $1799.** NuBus board has a DOS processor, letting you have your Mac and a PC, too. It's fairly well executed, though there are some minor problems. Oct 93

★★★ **PLI MiniArray 850MB, PLI MiniArray 2GB, Peripheral Land, 510/657-2211, $4999, $6999.** These RAID storage systems contain multiple drives that work as a single unit; they're an excellent option for image processing or tasks that involve importing and exporting large files, but the price per megabyte is high. Jan 93

★★★ **SmartStack, Envisio, 612/628-6288, SmartSource $119; SmartModules $289 to $1379.** The SmartStack line of modular storage peripherals may be neatly stacked on top of a common power supply to reduce desktop clutter and cabling problems. Sep 93

VIDEO/DISPLAY

★★★ **BookView Imperial, Computer Care, 612/371-0061, $1399 (includes 6MB of RAM).** This notebook-display adapter supports all common sizes of monitors, including 16-inch and 19-inch, plus both Mac and VGA. It is expensive, however, and uses 2MB of system memory for video processing. Feb 93

★★★ **Dycam Model 3, Dycam, 818/998-8008, $895.** Low-end, digital still camera is easy to use, and is a solid product if Instamatic grade gray-scale meets your image quality requirements. Sep 93

★★★ **L-TV, Lapis Technologies, 510/748-1600, $349.** Interface board allows a Mac LC, LC II, or Performa to use a standard television monitor as a display device. Unfortunately, a standard TV is a poor substitute for a color monitor, so while the L-TV does its job adequately, the setup is unsuitable for many applications. May 93

★★★ **Lightning Effects II, Spectral Innovations, 408/955-0366, $1295.** Digital-signal-processor chips dramatically speed up some Photoshop operations with this expensive Photoshop-acceleration board. It had problems acquiring some JPEG files. May 93

★★★ **PaintBoard Turbo, RasterOps, 408/562-4200, $1499.** Midrange video board supports 24-bit color on monitors up to 17 inches and resolutions as high as 1024 by 768 pixels. If you can live without changing resolutions on the fly, it's a reasonably good deal. Oct 93

★★★ **Power Portrait, Sigma Designs, 510/770-0100, $899 or $949.** Hook your Classic or PowerBook to this 15-inch portrait-style monochrome display. Built-in QuickDraw acceleration speeds up the slow SCSI connection on the one hand and results in a few software incompatibilities on the other. Feb 93

★★★★ **PowerVision, Mirror Technologies, 612/633-4450, $499 to $999.** Separate VRAM means you don't lose system memory with this nicely priced notebook display adapter. It only supports 12-inch and 14-inch monitors, and 15-inch portrait gray-scale and black-and-white monitors. Feb 93

★★★★ **ThunderStorm, SuperMac Technology, 408/245-2202, $699.** Photoshop-acceleration board uses digital-signal-processor chips to speed up some Photoshop operations. It's fast, with good JPEG compatibility and a great manual. May 93

★★★★ **VideoSpigot, SuperMac Technology, 408/245-2202, $449 to $1299.** Grab video from a camcorder, video deck, TV, or monitor with this easy-to-install board and save it as a 24-bit QuickTime movie. Comes with ScreenPlay, an application that lets you choose from among several compression options, frame rates, and window sizes. May 92

★★★ **VideoToolkit 2.0.1, Abbate Video, 508/376-3712, $279.** Despite a few rough edges, this is an attractive, inexpensive solution for those who need to catalog and edit videotapes on a budget. Sep 93 m

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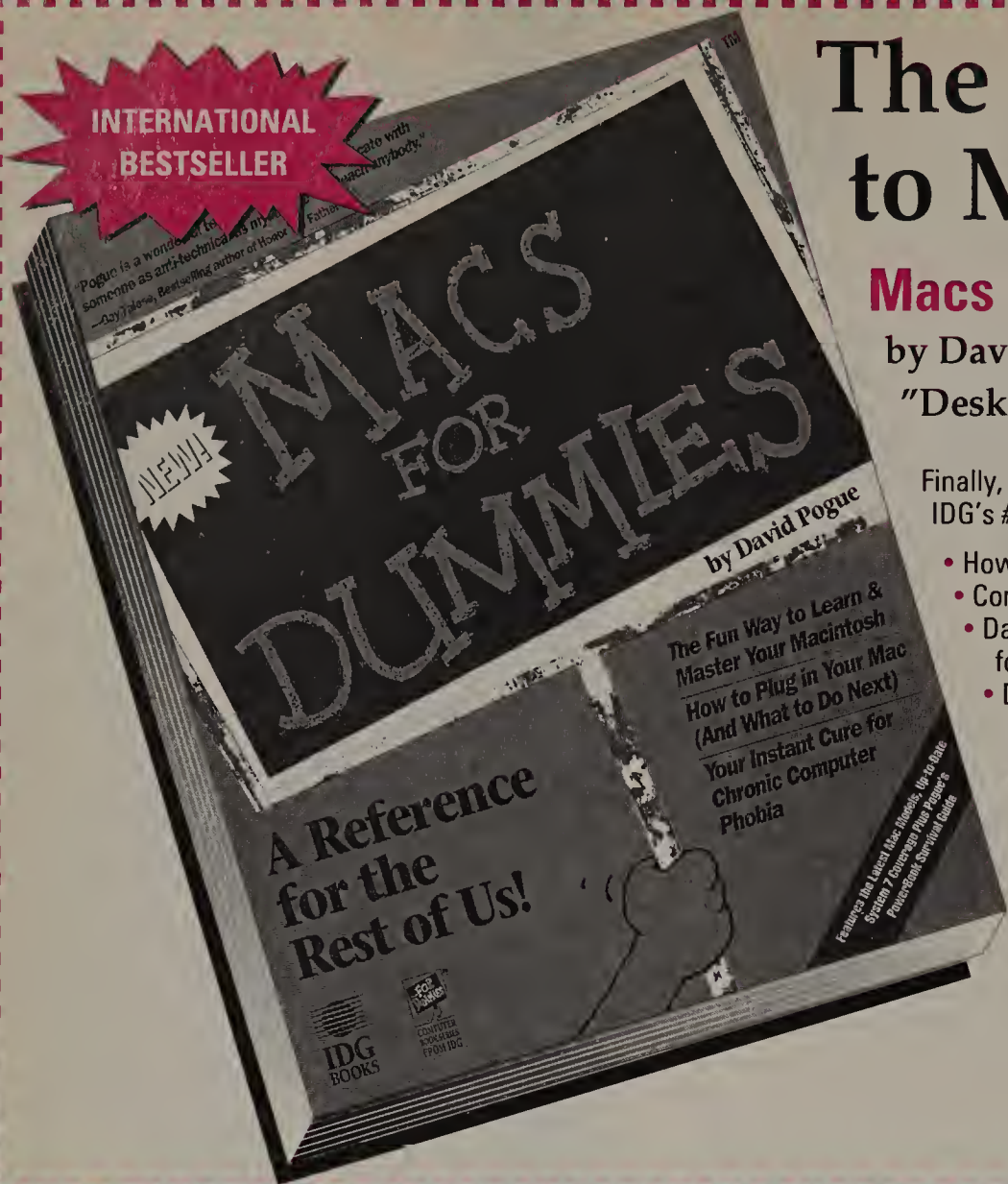

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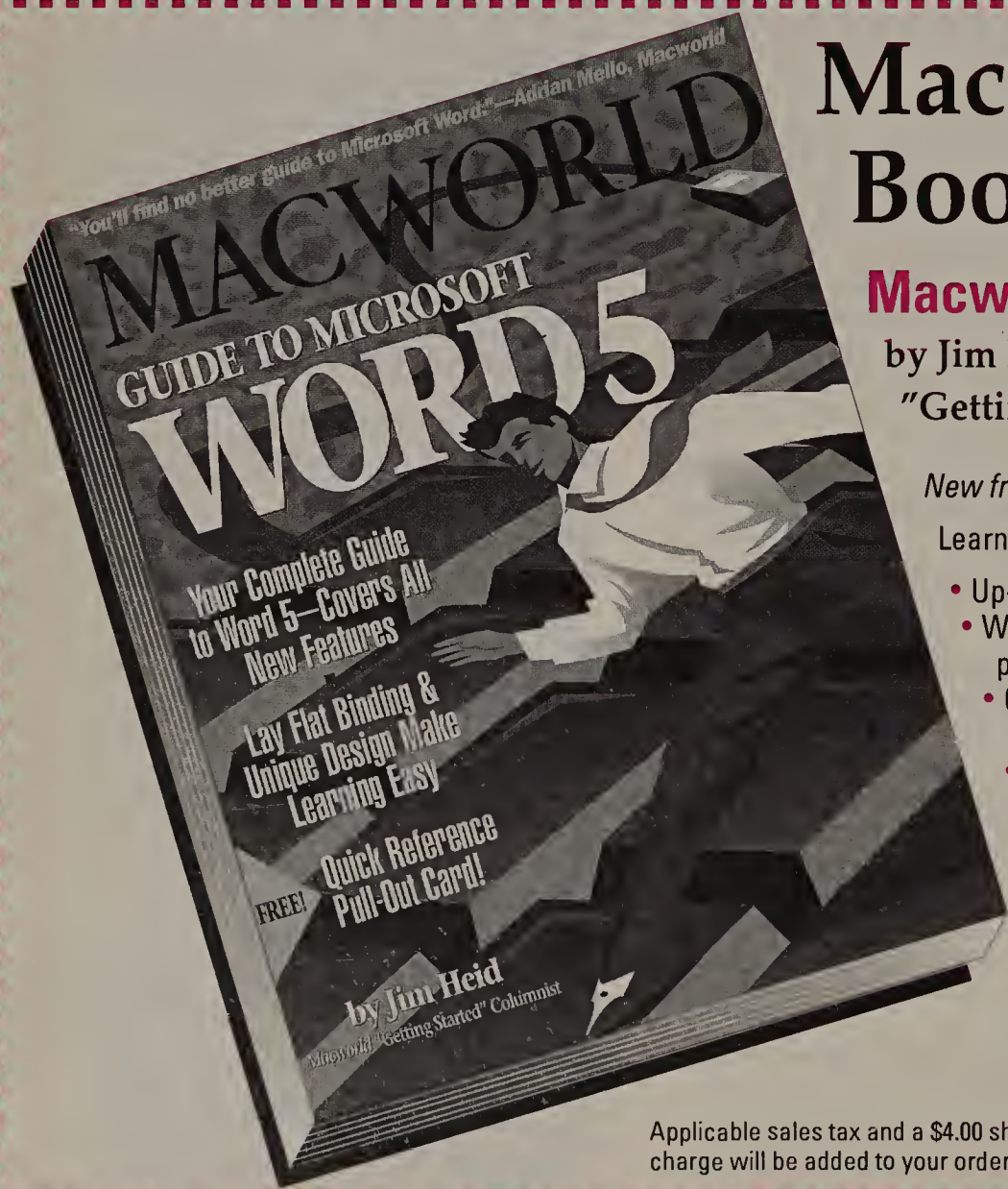

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BUNDLES

Alias Sketch 1.5 + Adobe Illustrator 5.0 or Photoshop 2.5 The Mac Zone is offering Alias's $995 illustration and rendering program (Jul 93 ★★★★—"one of the best upgrade values this tightwad has had the pleasure of reviewing"; Aug 93 "Depth-Defying Design" Editors' Choice—"lowest-priced program with top-quality modeling features") bundled with either Adobe's $595 Illustrator draw program (Nov 93 ★★★★—"has always been the most dependable drawing program on the Mac. Now it's also the most powerful"; 1993 World-Class) or Adobe's $995 Photoshop color-image editor (Jun 93 ★★★★; 1993 World-Class). Available through The Mac Zone (800/248-0800) for $758.98. *Offer expires 11/15/93.*

ClarisWorks 2.0 + Quicken 4.0 Claris is including Intuit's $69.95 personal-finance package (Nov 93 ★★★★—"easy to learn and powerful to use"; 1993 World-Class) free with ClarisWorks, its $299 integrated software program (Aug 93 ★★★★—"sets the standard by which other integrated programs must be judged"; 1993 World-Class). Call 800/325-2747 to locate the Claris authorized reseller nearest you. *Offer expires 1/31/94.*

Common Ground 1.0 + 40 Bitstream Fonts No Hands Software is including a $1290 collection of 40 Bitstream PostScript Type 1 fonts free with Common Ground, its $189.95 electronic-document-distribution program (Oct 93 ★★★★—"admirably cost-effective and easy-to-use"). Available through mail order, or call 800/598-3821 for nearest reseller. *Offer expires 12/31/93.*

In Control 2.0 + Dynodex 3.0 Attain Corp. is bundling Portfolio Software's $89.95 address-book software (Apr 93 ★★★—"as an address-book manager and printing program, Dynodex does an excellent job"; 1993 World-Class) with its $129.95 In Control to-do list organizer (Aug 93 ★★★★—"combines the best features of an outlining program with those of a database"). Available through MacConnection (800/800-2222) and MacWarehouse (800/255-6227) for $99. *Offer expires 12/31/93.*

M.Y.O.B. 3.0 + Cogito 1.1 Teleware is bundling Inline Software's $59.95 puzzle strategy game (Apr 93 ★★★—"this baby [is] a real brain-buster") with its $199.95 M.Y.O.B. (Mind Your Own Business) small-business-oriented accounting system (Nov 93 "Growing a Small Business" Editors' Choice—"its slick interface and omnipresent to-do list ease the bookkeeper's job"; 1993 World-Class). Available direct (800/851-1315) for $99.95. *Offer expires 12/31/93.*

Painter 2.0 + Wacom Digitizing Tablet Fractal Design is bundling a choice of Wacom Technology's 6-by-8-inch $449 ArtZ ADB Tablet (Aug 93 ★★★★—"can draw out the best from today's natural-media-emulation graphics programs") or the 12-by-12-inch $995 SD-420E model, with Fractal Design's $399 Painter color paint natural-media program (Jul 93 ★★★★ "provides the real meat-and-potato tools required by professional artists"). Available through national resellers for $499 with the ArtZ ADB Tablet and $739 with the SD-420E. *Offer expires 10/31/93.*

Rae Assist 1.0 + CPU 2.0 or CDU 1.0 Rae Technology is including a choice of either Connectix's $99 PowerBook Utilities (Sep 93 ★★★★—"I consider this extensive collection of features indispensable") or the $99 collection of 16 Connectix Desktop Utilities (Nov 93 ★★★—"offers several popular power-user features and includes a powerful file-synchronization utility") free with its new $199 Rae Assist personal information manager. Call 408/725-2850 to locate the participating reseller nearest you. *Offer expires 10/31/93.*

SupraFaxModem V.32bis MacPac + Communications Software Mac's Place is offering Supra's $479.95 MacPac consisting of a 14.4-Kbps fax modem plus fax and telecom software (Aug 92 ★★★★—"an excellent value," "I strongly recommend") bundled with T/Maker's $39.95 FaxMania collection of 80 electronic fax cover sheets, InterCon Systems' $29.95 WorldLink for connecting to Internet (plus 30 days of free Internet access) and messaging worldwide, and the latest version of CompuServe's $39.95 Information Manager interface to its services and databases. Available through Mac's Place (800/367-4222; fax 800/881-3090) for $288. *Offer expires 12/31/93.*

COMPETITIVE UPGRADES

PBTools 1.1 Inline Software is offering this $99.95 PowerBook utility (Jul 93 ★★★ for version 1.0.1—"basic PowerBook management without added frills or complex menu-bar displays") to users of any other PowerBook utility. Available direct (800/453-7671) for $25 (plus $4 shipping and handling). *Offer expires 12/31/93.*

DISCOUNTS/REBATES

Aldus PageMaker 5.0, Adobe Illustrator 5.0, Adobe Photoshop 2.5 Tutorials Personal Training Systems is offering interactive, self-paced tutorials, which include 90-minute audiocassettes and practice disks with lesson files, for the latest versions of PageMaker, Illustrator, and Photoshop (you can choose from beginner, intermediate, or advanced levels). These tutorials are available direct (800/832-2499) for $39.95 each (regularly $54.95). *Offer expires 12/31/93.*

HP ScanJet IIc Hewlett-Packard is offering a $200 rebate on the selling price of this $1599 color flatbed desktop scanner (Nov 93 "Low-Cost Color Scanners" Editors' Choice—"received the highest overall rating [very good]"; 1992 World-Class) when purchased after 7/31/93 through an authorized dealer. Call 800/722-6538 for proof-of-purchase requirements. *Offer expires 10/31/93.*

MacMoney 4.0 Survivor Software is offering this $89.95 home-office/personal-finance accounting package (Nov 93 "Growing a Small Business" Editors' Choice for version 3.5.3—"its invoice-writing add-on, Invoicit, and its ability to import from Aatrix's Paycheck give MacMoney an edge") direct (310/410-9527) for $45. *Offer expires 12/15/93.*

Magnet 1.0 No Hands Software is offering this $129.95 intelligent-agent-based utility for automating file management (Feb 93 ★★★★—"anyone who routinely works with multiple disks will find Magnet invaluable") for $49 (regularly $85 to $89). Available through mail order, or call 800/598-3821 for nearest reseller. *Offer expires 12/31/93.*

OmniPage 3.0 and OmniPage Professional 2.1.2 Caere Corporation is offering $100 and $200 rebates, respectively, on the selling price of its $695 OmniPage and $995 OmniPage Professional (Nov 93 "OCR: The Recognition You Deserve" Editors' Choice for OmniPage Pro version 2.1—"offers superior accuracy and an excellent user interface") optical character recognition packages when purchased after 7/31/93. Caere's $495 Image Assistant 1.1 for editing images is bundled with OmniPage Professional during this promotion. Call 800/535-7226 for proof-of-purchase requirements. *Offer expires 10/31/93.*

SoftPolish 1.1 Language Systems is offering this $295 quality-assurance development tool (Sept 93 ★★★—"well worth its [list] price to serious programmers") direct (800/252-6479, 703/478-0181) for $149. *Offer expires 12/31/93.*

Thunder 7 1.5.3 Baseline Publishing is offering this $99.95 spelling checker and thesaurus (Nov 93 ★★★★—"sports an improved interface and a host of new writing aids") direct (800/926-9677) for $49.95. *Offer extended to 11/15/93.*

VideoToolkit 2.0.1 Abbate Video is offering a $29 rebate on the selling price of this $279 video-editing package (Sep 93 ★★★—"a very good choice for videotape editing and logging") when purchased through an authorized reseller. Call 508/376-3712 for proof-of-purchase requirements. *Offer expires 12/31/93.* m

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For conference information fast, call 1-800-945-3313

Macworld Product Index

A quick and easy product index from MacWorld. Simply use this index to find the page or advertiser of the products which interest you. Then, use the reader service number for our FastFacts Product Information Card located on the next page.

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6	Image Club	50	800/661-9410
301	Innovative Data Design	129	510/680-6818
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143	Xante Corp.	1	800/926-8839

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Macworld

JUST FOR YOU. FREE PRODUCT INFORMATION FROM MACWORLD.

There's no cost or obligation. We even pay the postage! Simply fill in the questionnaire, then circle the numbers on the card below for the products that interest you. Numbers for advertised products can be found in the ad and in both the Product Index and Ad Index. Fold card and mail. No staples please.

FASTFAX
For faster results just fax this sheet to +1-413-637-4343. Please indicate your fax number where indicated.

Please answer these questions so that we may better serve you.

A. Including yourself, approximately how many people are employed at your entire work-site (i.e., employees in your office, building, or cluster of buildings)? (Check one.)

- 01 ❑ 1000+
- 02 ❑ 999 - 100
- 03 ❑ 99 - 25
- 04 ❑ Under 25

B. Which of the following computers are installed at this entire work-site? (Check all that apply.)

- 05 ❑ Apple Workgroup Servers/ Mac Quadra-series
- 06 ❑ Mac Centris-series/II-series/LC III/ Performa 600/450/SE 30
- 07 ❑ Mac LC/LC II/Performa 430/405/ 400/200/Classic-series/SE/Plus/ 512K/128K/Portable
- 08 ❑ Mac PowerBook-series/Duo-series

C. What is the total number of Macs installed at this entire work-site? (Check one.)

D. For how many Macintosh computers within this entire work-site do you have purchase involvement for products and/ or services? (Check one.)

	C	D
500+	❑ 09	❑ 15
499 - 100	❑ 10	❑ 16
99 - 50	❑ 11	❑ 17
49 - 10	❑ 12	❑ 18
9 - 1	❑ 13	❑ 19
None	❑ 14	❑ 20

E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)

- 21 ❑ Initiate/Determine need for product/capabilities/features
- 22 ❑ Evaluate, recommend, or approve brands/models
- 23 ❑ Evaluate, recommend, or approve purchase source
- 24 ❑ Authorize purchases

F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)

- 25 ❑ $1 million or more
- 26 ❑ $999,999 – $500,000
- 27 ❑ $499,999 – $100,000
- 28 ❑ $99,999 – $50,000
- 29 ❑ $49,999 – $10,000
- 30 ❑ Under $10,000

G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)

- 31 ❑ Business software (Word processing, spreadsheet, database, etc.)
- 32 ❑ Graphics/publishing software
- 33 ❑ Monitors/displays
- 34 ❑ Printers/scanners
- 35 ❑ Networking/communications hardware and/or software
- 36 ❑ Multimedia/AV hardware and/or software
- 37 ❑ Mobile computing products (PowerBooks, peripherals, software, etc.)

H. What is your primary job function? (Check one.)

- 38 ❑ Computer Reseller/VAR/VAD
- 39 ❑ MIS/DP/IS/Network Management
- 40 ❑ Engineering
- 41 ❑ R&D/Scientific
- 42 ❑ Corporate/General Management
- 43 ❑ Accounting/Finance
- 44 ❑ Marketing/Sales/PR/ Communications
- 45 ❑ Art/Design/Creative Services

Thank You!

Please print or type all information.

Title _____

Co. _____

Phone _____

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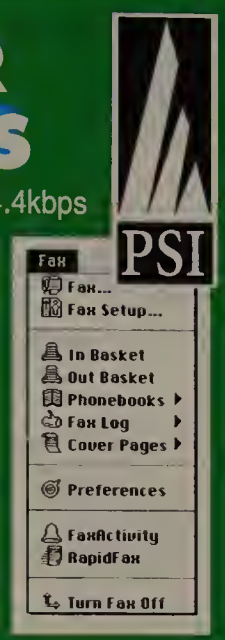

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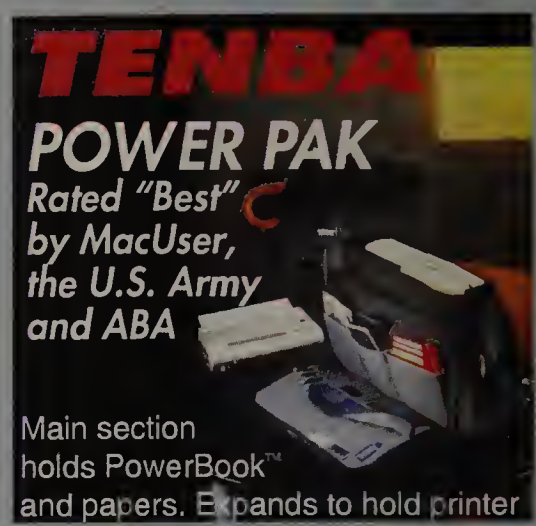

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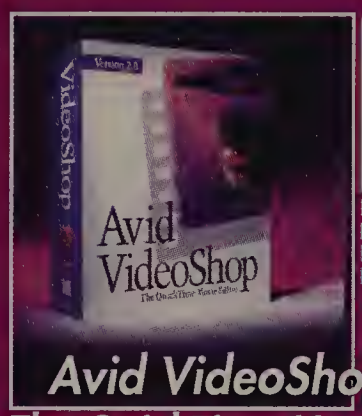

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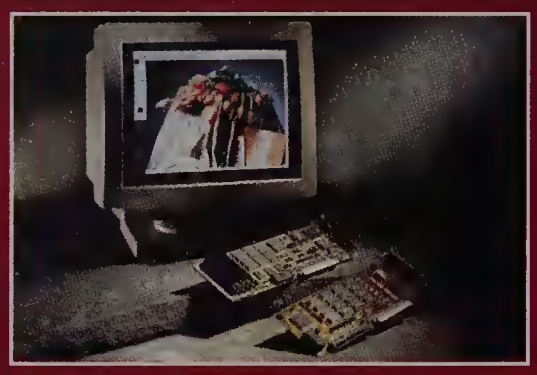

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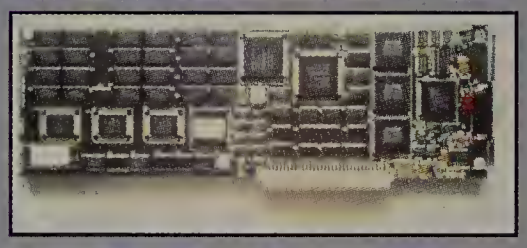

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RasterOps PaintBoard Li **$799**

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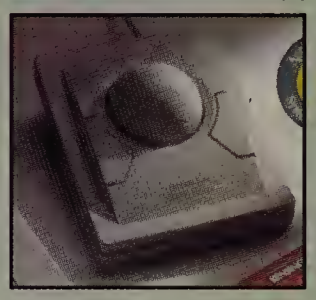

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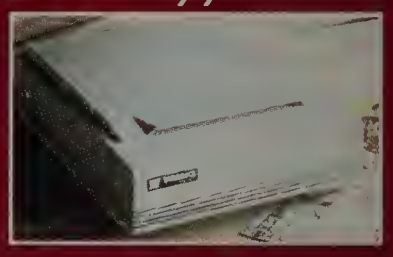

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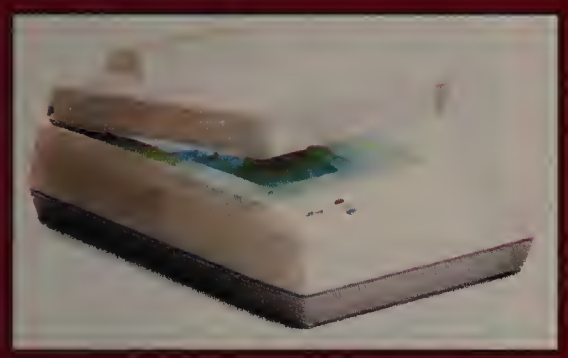

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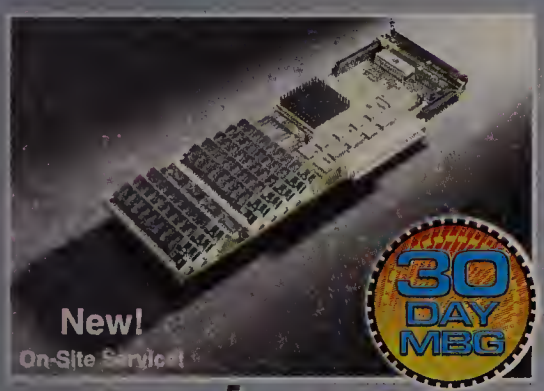

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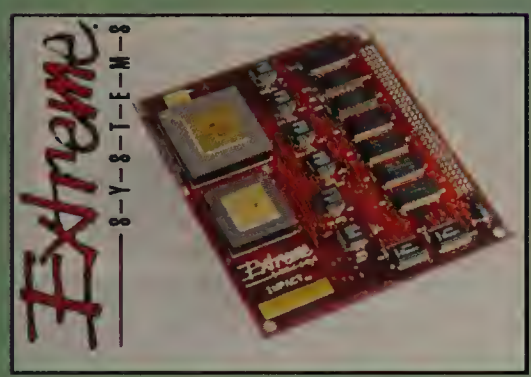

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WINNER MacWEEK 1992

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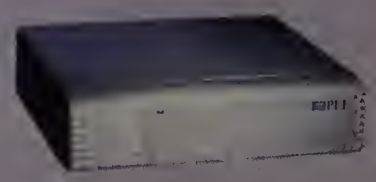

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PLI 1GB Disk Array Internal	2,069
PLI 2GB Disk Array External	3,139
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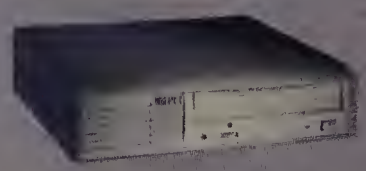

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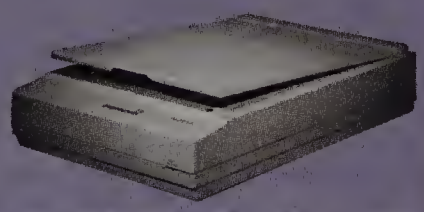

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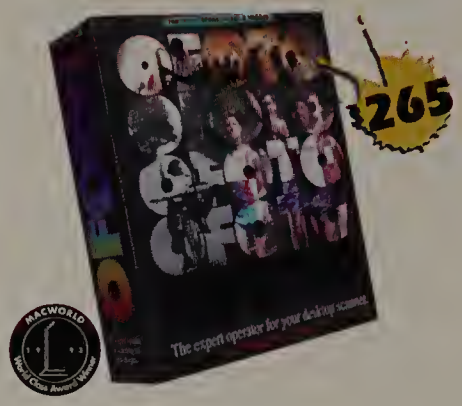

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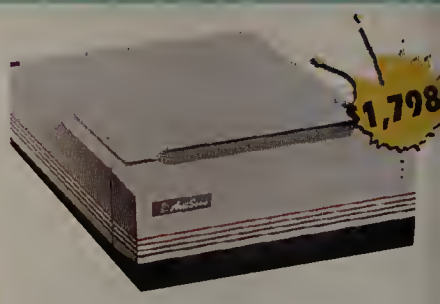

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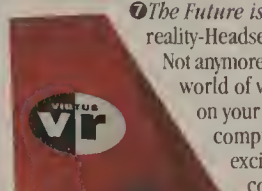

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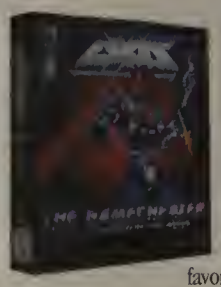
GameCheater



❼GameCheater is a control panel device that allows you to cheat at dozens of Mac games. Be undefeatable! Conquer every adversary, every time! GameCheater works with all your favorites including Prince of Persia, Hellcats over the Pacific and Spectre. Get GameCheater and you'll be invincible.

Publisher: Baseline Publishing
ENT0556
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❼Fractal Design Painter X2, an expert extension to Painter 2.0, revolutionizes the way artists and designers combine and orchestrate multiple graphic elements. With X2 any number of floating selections can be painted into, around or under; they may be scaled, rotated and distorted.

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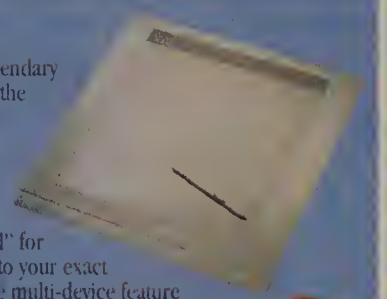
❼Painter, the award winning 24-bit color, Natural-media™ painting program, now includes photo design features. New features include image retouching, color separations, font support, and much more. Perfect for artists or wannabes!

GRA0412 $279.95*
Publisher: Fractal Design
$279.95*

UD-1212R



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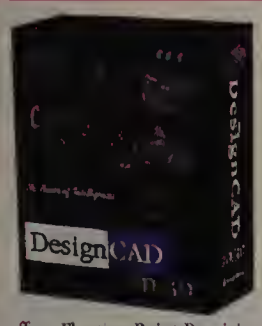

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CAD0043

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Publisher: Aldus BUS0299
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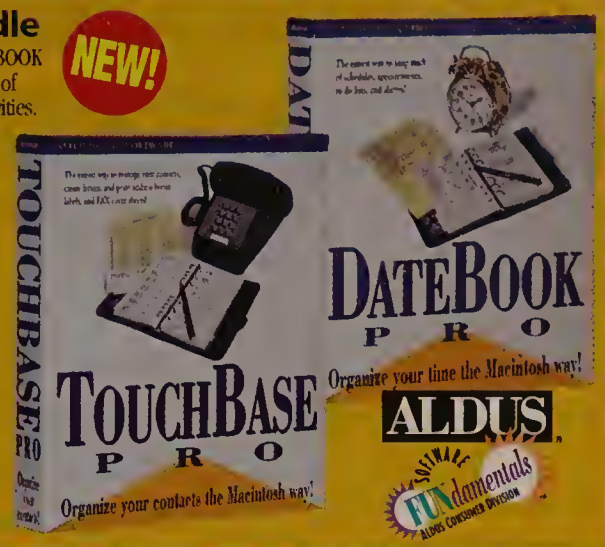

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❼**MiniCad+4**: An unsurpassed mix of ease of use and powerful features defines MiniCad+4. The award-winning MiniCad+ combines 2D CAD, true 3D CAD, a database/spreadsheet, programming language, intelligent interface and AutoCAD translator into one program. New features include 3D walkthrough and flyover tools, tolerancing, automatic roof, wall, and floor tools, and more. **CAD0030 $595.95**

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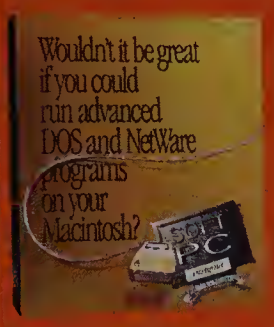
SoftPC Professional 3.1



❼Run DOS and NetWare Applications with VGA Graphics on Macintosh Computers. SoftPC is the software only solution that lets you run more than 50,000 standard or custom DOS applications on your Mac. SoftPC PROFESSIONAL runs PC programs which utilize VGA graphics and extended memory. SoftPC PROFESSIONAL has MS-DOS 5.0 pre-installed and is ready-to-run on your Mac.

Requires: Suitable for the MacII cx, ci, si, fx, PowerBook, Performas and all Quadra computers.

Publisher: Insignia Solutions
COM0141

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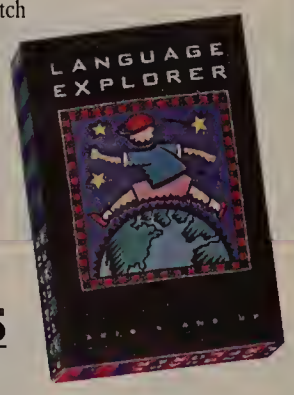
Language Explorer

❼Animate the discovery of language in English, French, German and Spanish. Languages are presented in 42 topics, with over 500 colorful, animated pictures. Simply select a topic and language, then match words to pictures. Five levels of difficulty add new challenges-from the basic exploration of Beginner, to all languages and topics at the Polyglot level! All ages.

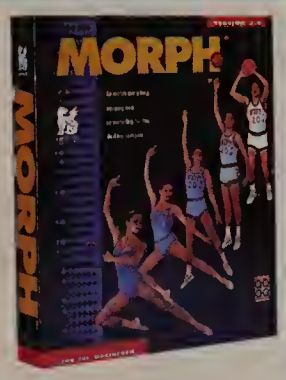
Requires: Color Mac, System 6.0.7 or greater.

Publisher: Nordic Software
EDU0490



$32.95

Morph 2.0



❼The hottest image effect of the nineties is now available on the Macintosh! Morph™ smoothly transforms one image into another, creating dazzling images and effects like turning last year's car model into this year's or a futuristic cyborg villain disguising itself as a valiant heroine. Morph™ is fast, easy-to-use, and is also QuickTime-savvy.

Publisher: Gryphon Software
GRA0505

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❼NEW! Aldus Super-Paint 3.5 combines the best of paint and draw packages for anything from the simplest business illustrations to sophisticated full-color art. New features: Copy Brush, Crop Mark, Grid, Magic Marker, and pressure sensitive tools, templates and more.

GRA0503

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❼Aldus Personal Press 2.0 is page layout software that intelligently assembles your text and graphics automatically. Includes "Intelligent" templates, copy fitting, word processing, text wrap, free roation, drawing tools.

DTP0080 Publisher: Aldus

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WristSaver or MousePad

The WristSaver cradles your wrist with a contoured neoprene rubber pad and a washable nylon covering. It's ergonomically designed to support your wrist at the proper angle to help avoid the pain associated with Carpal Tunnel Syndrome. The WristSaver MousePad (8" x 9.5") provides a comfortable rest for your wrist, plus a conventional mouse pad. Simple finger movements replace sliding the entire arm or hand. **Manufacturer: LB Innovators**

ACC0560 WristSaver (Red)
ACC0635 MousePad (Red)
Available in Gray, Black, Red or Navy. Please specify color.

$15.95 ea.

Star Trek 25th Anniversary

❼Pilot the famous U.S.S. Enterprise on a wild ride through the final frontier. This exciting game combines a realistic 3D space flight simulator with role-playing adventures featuring the Star Trek team. Control phasers, photon torpedoes, shields, communications, warp drives. Beam down to alien worlds, Come face-to-face with dozens of alien races. Complete with musical score and digitized sound effects.

Requires: Color Mac with 1500K free memory; System 6.0.7 or later.

Publisher: MacPlay
ENT0578

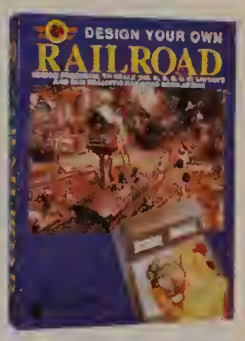
$35.95

Design Your Own Railroad

❼Design Your Own Railroad enables you to design, build, and operate a model railroad on your Mac. Lay out the track using precision CAD tools. Draw scenery with a complete set of color drawing tools. Operation includes coupling and uncoupling, switching, pickup and delivery of loads with revenue tracking, and, of course, crashing! It's an indispensable tool for serious modelers, and fun for rail fans of all ages.

Requires: 1 MB memory; hard drive recommended.

Publisher: Abracadata
GRA0398



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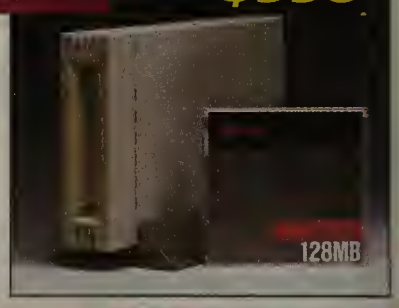

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• 800 dpi, interpulation up to 1600 dpi
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Now blazing 24-bit accelerated color for 12"-21" screens at half the cost.

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• 300 dpi • 9 ppm
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NewGen Turbo PS/ 660p CALL
600 dpi, Canon engine, 35 fonts

Dataproducts LZR 965 $1769
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• 16" Multimode Sony Trinitron display
• 4 resolutions: 640 x 480 to 1152 x 870

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80mb	17ms	$209	$309
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525mb	10ms	$629	$689

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Capacity	Access	Internal	External
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85mb	17ms	$164	$224
127mb	17ms	$188	$248
170mb	17ms	$194	$254

PRODRIVE SERIES
3.5" HALF HEIGHT

Capacity	Access	Internal	External
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700mb	10ms	$799	$859
1.0GIG	10ms	$899	$959
1.2GIG	10ms	$999	$1059

Quantum LPS, ELS and PRO drives carry a TWO Year Warranty. Quantum GD•DRIVEs carry a ONE Year Warranty.

* One Year Warranty

FUJITSU

FIVE YEAR WARRANTY

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
230mb*	M2637	2.5" Low Profile	15ms	220mb	$499	$599
520mb	M2624	3.5" Half Height	9ms	496mb	$631	$691
1.2GIG	M2694	3.5" Half Height	8.5ms	995mb	$976	$1036
2.4GIG	M2654	5.25" Full Height	11.5ms	2000mb	$1715	$1815

Seagate

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
3.5" HALF HEIGHT						
1.2GIG	ST11200N		10.5ms	1000mb	$919	$979
2.4GIG	ST12400N		9ms	2000mb	$1979	$2039
1.9GIG	ST11950N	*Barracuda 1*	8ms	1350mb	$1799	$1859
2.4GIG	ST12550N	*Barracuda 2*	8ms	2050mb	$2239	$2299
5.25" FULL HEIGHT						
1.6GIG	ST41651N	Wren-8	15ms	1350mb	$1269	$1369
2.1GIG	ST42100N	Wren-9	12.9ms	1900mb	$1435	$1535
2.4GIG	ST42400N	Elite-2	11ms	2050mb	$1785	$1885
3.4GIG	ST43400N	Elite-3	11ms	2750mb	$2265	$2365

Seagate drives carry a ONE Year Warranty.

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FREE RETROSPECT V2.0 BACKUP SOFTWARE

Capacity	Model	Media	Internal	External
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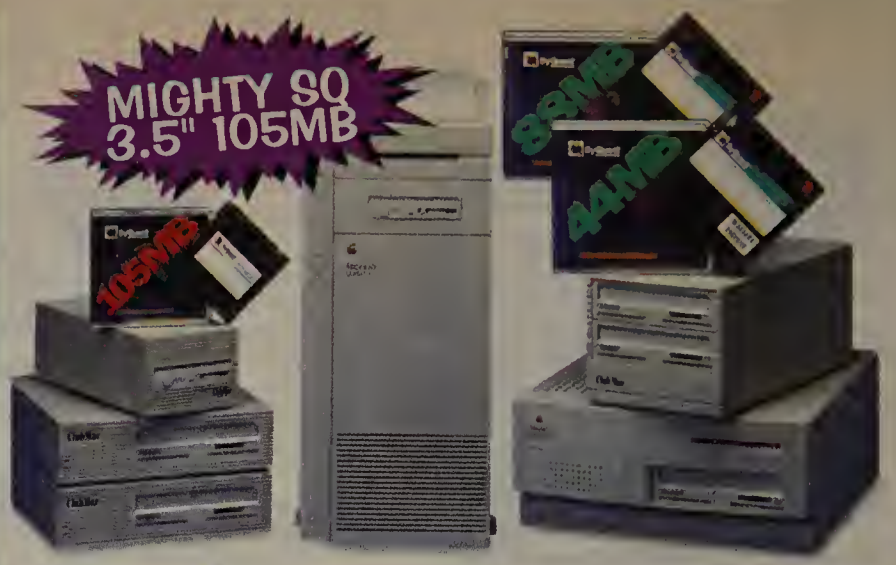
600mb	Teac MT2ST/F50	CT600F	$629	$649
DAT TAPE BACKUP SYSTEMS				
2.0GIG	Archive Python	4mm	$979	$999
3-5GIG	Archive Turba DAT*	4mm	$1229	$1249
2.0GIG	WangDAT 3100	4mm	$999	$1019
3-5GIG	WangDAT 3200*	4mm	$1079	$1099
2.0GIG	HP 35470A	4mm	$1179	$1199
3-5GIG	HP 35480A*	4mm	$1279	$1299
8MM TAPE BACKUP SYSTEMS				
2-5GIG	Exabyte 8205	8mm	$1655	$1675
5-10GIG	Exabyte 8505	8mm	$2609	$2629

Includes RetroSpect v.2.0 Backup Software, One Tape & ONE Year Warranty. * Data Compression.



FEATURING

SyQuest® REMOVABLE TECHNOLOGY

SyQuest Drives include a TWO Year Warranty, one cartridge & necessary cables, SCSI Director™ Formatting Utility. SyQuest Cartridges carry a ONE Year Warranty.

CLUBMAC 3.5" 105MB REMOVABLES	
ClubMac 105mb External (SQ3105S)	$599
ClubMac 105mb Internal (Q900/950)	$569
CLUBMAC 88C REMOVABLES*	
ClubMac 88c External (SQ5110C)	$499
ClubMac 88c Internal	$469
ClubMac 88c Dual	$929
* ClubMac 88c will read and write 44mb cartridges, but will not format 44mb cartridges.	
CLUBMAC 44MB REMOVABLES	
ClubMac 44mb External (SQ555)	$329
ClubMac 44mb Internal	$289
ClubMac 44mb Dual	$589
CLUBMAC 88MB REMOVABLES	
ClubMac 88mb External (SQ5110)	$445
ClubMac 88mb Internal	$415
ClubMac 88mb Dual	$799
REMOVABLE CARTRIDGES	
105mb / 44mb / 88mb Cartridge	$59 / 59 / 96

CD-ROMs Solutions

ClubMac External CD-ROM-S $425
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ClubMac External CD-ROM-T $489
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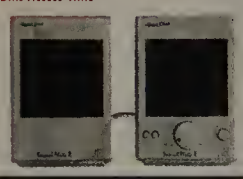
NEC MultiSpin 74-1 280 ms Access Time	$399	$499
NEC MultiSpin 38 480 ms Access Time	$269	$369



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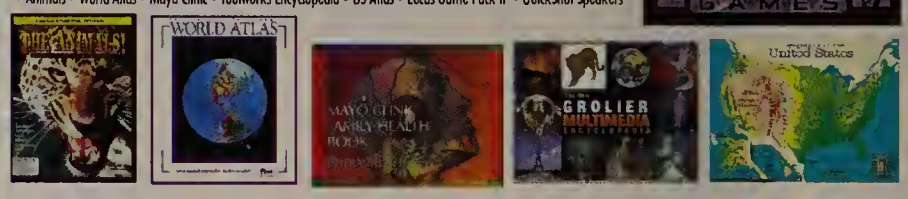
LUCASFILM GAMES



ClubMac OPTICAL Drives

Model		Capacity	Description	Seek	Internal	External
DynaMo	**Fujitsu**	**128mb**	**3.5" Low Profile**	**35ms**		**$929**
CMO-M2511A	Fujitsu	128mb	3.5" Low Profile	35ms	$899	$929
CMO-3D3000	Teac	128mb	3.5" Half Height	45ms	$769	$799
CMO-OMD5010	Epson	128mb	3.5" Half Height	45ms	$899	$929
CMO-3100E	Ricoh	128mb	3.5" Half Height	45ms	$899	$929
CMO-JY750	Sharp	594/652mb	5.25" Half Height	40ms	$1799	$1829
CMO-5031E	Ricoh	594/652mb	5.25" Full Height	28ms		$2249
CMO-Tohiti II	MaxOptix	650/1.0GIG	5.25" Full Height	35ms		$2899

128mb / 594-652mb / ZCAV Cartridge for MaxOptix $39 / 99 / 175

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- Comp. with on-board graphics on the Quadra and Centris

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MacUser Magazine January 1993

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Silentwriter 95f $899
Silentwriter 97 ..... $1119
Silentwriter 95fx $1139
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GLOBAL VILLAGE TELEPORT (External Desktop)
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PSI MODEMS

PowerModem I / II / III / IV ..... $119 / 225 / 319 / 359
Comstation I / Comstation V ..... $135 / 429

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FNTNA	Thn FriendlyNet Media Adapter	$65
MC+IIE64	Mac II & Perf 600, Thk/Thn, 64K	$145
MAC+IIET64	Mac II & Perf 600, Thk, 10BT, 64K	$145
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for Quadras, Centris, Lasers, 10BaseT, 4 LEDs
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SWEET 16 MONITOR MacUser Magazine January 1993 Rasterops Sweet 16

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PrecisionColor Display/20v .. $2299
PrecisionColor Pivot $929
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Two Page Display (TPD)/21 ..... $819
Two Page Display (TPD)/21E .. $1099

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PrecisionColor Pro 24XP $499
PrecisionColor 24X $1479
PrecisionColor24XP $425
PrecisionColor 24XK $815
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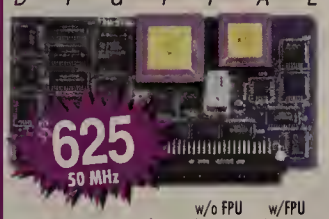

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Eclipse 8 (8ppm,RISC,Ethernet) $1498

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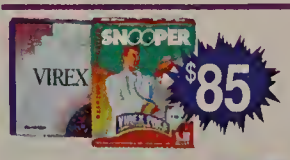

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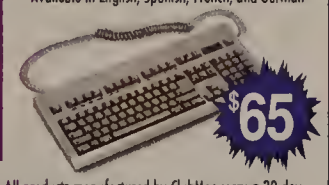

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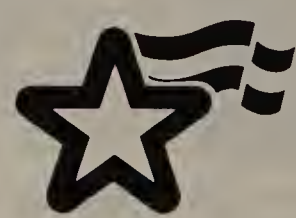

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NEC

6674/6675 MultiSync 6FG Monitor, 24X Color Card, & Free MultiSpin 74 CD-ROM Drive

*FREE CD-ROM coupon available by fax at 800-366-0476. Ask for document #23.

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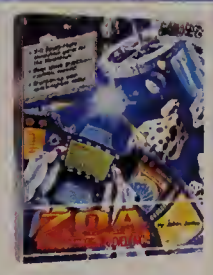
NEW!

$36.



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Aldus

6897 IntelliDraw 2.0 ○

ALDUS

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Minimum requirements: Mac Plus, 1MB RAM, System 6.0.4, CD-ROM drive.

FWB

5731 CD-ROM ToolKit

FWB incorporated

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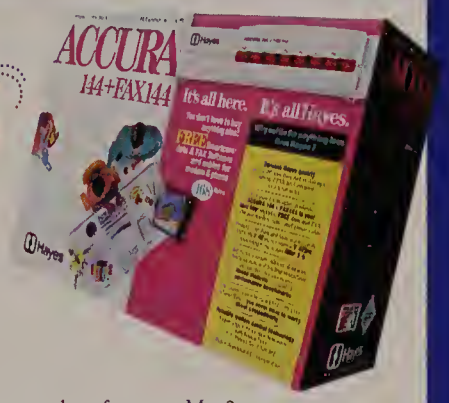

ACCURA 144+ FAX 144

Looking for a high-performance data and fax modem for your Mac? The ACCURA 144 + FAX144 is a cost-efficient V.32bis/14,400 bps data communications and Group 3/14,400 bps fax modem. It supports standard 14,400-300 bps data transmission and provides 14,400-2400 Group 3 send and receive fax capability. High-performance V.42/V.42bis, MNP 5 error-control, and data compression protect your data and improve accuracy. Throughput is up to 57,600 bps using V.42bis data compression. Best of all, you'll be up and running fast with Smartcom data and fax software FREE ($128 value)!

Minimum requirements: MacPlus, 1MB RAM.

Hayes

6068 ACCURA 144+ FAX 144

Hayes

$89.

NEW!

QuickFLIX

QuickFLIX is the first, inexpensive movie-making tool for Mac users.

It makes the production of QuickTime movies more affordable. And it's got the power to build video for business presentations, educational uses, CD-ROMs, or just for fun. QuickFLIX has all the software tools you need to produce your own movies including digitizing, editing, basic special effects, sound editing, titling, layering, and motion control. All in a familiar Macintosh interface. This program can even use Apple's new speech recognition technology, so you can speak to edit your movies if you've got a new Quadra 840AV or Centris 660AV. Don't doom another vacation's memories to a dusty collection of unedited VHS tapes. Get QuickFLIX.

Minimum requirements: Mac II, 3MB RAM, System 7, a hard disk.

VideoFusion

6784 QuickFLIX

VIDEOFUSION

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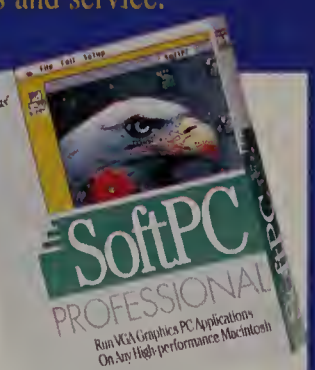


SoftPC Professional

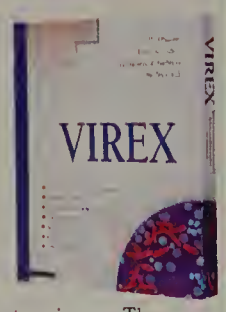
Do the PC one better by bringing PC applications to your Mac! There's no need to add hardware. With SoftPC, software does it all. SoftPC Professional 3.0 emulates VGA graphics giving you 256 colors and increased monitor resolutions to show crisp, realistic, and vibrant graphics. It emulates an 80286 processor and an Intel 80287 math coprocessor. Run protected-mode MS-DOS applications which have been written to utilize extended memory. MS-DOS 5.0 is pre-installed. And Microsoft CD-ROM extensions are also included, which means you can run PC CD-ROMs with your Mac CD-ROM drive. Plus, you can easily copy and paste text and graphics between PC and Mac applications.

Minimum requirements: SE/30, BMB RAM, System 6.0, 6MB hard drive space.

Insignia Solutions

5925 SoftPC Professional

$59.



Virex 4.0

Virex 4.0 is the ultimate weapon against the threat of Macintosh computer viruses. The application detects and repairs files infected by all known Macintosh viruses. The Record/Scan feature lets you identify previously unknown viruses. The Virex INIT program continuously monitors the computer to prevent future infections, and Virex is the only anti-virus product with an INIT that performs instant repairs!

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.2.

Data Watch

5234 Virex 4.0 ○

NEW!

$36.

Crystal Crazy

This sequel to Crystal Quest has more crystals to collect, pool balls to sink, jigsaws to complete, and fragile ornaments to smash. Accomplish these entirely pointless tasks while avoiding eggs that hatch into space bunnies and much more. You'll be appalled at how much time you'll waste on this game – but you'll love every minute of it.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.2, hard drive, 4MB RAM for color.

Casady & Greene

5956 Crystal Crazy ○

CASADY & GREENE

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33 Fonts Total!

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Art Fonts & Cool Fonts Bundle

Get 33 fantastic, artistic fonts with this bundle. Your documents will stand out from the crowd when you use these original, award-winning, attention-grabbing display font designs that clearly turn heads and make people pause. These fonts offer designers, artists, and desktop publishers striking new typefaces at an extremely low cost. And you can fully customize all of them with programs such as Typestyler or Adobe Illustrator. Both Type-1 and TrueType formats are included, all fully compatible with ATM and System 6 or 7. Art Fonts received the "Most Distinctive Font" award from *MacUser*.

Olduvai

6894 Art Fonts & Cool Fonts Bundle

OLDUVAI

$78.

NEW!

MultiClip

MultiClip is a super-fast scrapbook/clipboard replacement that lets you have multiple clipboards and scrapbooks to save time and effort. Back-up everything you cut or copy, and even crop and edit your clippings for a perfect fit. "You'll find MultiClip so fun, productive, and amazingly easy to use, you'll soon wonder how you ever managed to work without it," says *Macworld*.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.5.

Olduvai

6895 MultiClip

OLDUVAI

$36.

Spaceway 2000

Test your intergalactic combat driving skills! Spaceway 2000 is a high-speed, alien-infested freeway. Watch out for Wall Creepers who crawl along the edge of the highway and fire at you, and Blockers who follow your movements like bad mimes and keep you from passing. Use laser cannons, automatic shields, smart bombs, and more to battle your way through.

Minimum requirements: Mac Plus (LC recommended), 2MB RAM, System 6.0.5, hard drive, 4MB RAM for color.

Casady & Greene

6906 Spaceway 2000 ○

CASADY & GREENE

$124.

Another Mac's Place Exclusive!

Help! & Peace of Mind Bundle

Catch incompatibilities and problems affecting your Mac with this bundle available only from Mac's Place. Help! is great technical support. It not only analyzes systems and highlights potential problems, but it also suggests possible solutions to those problems. Help! collects information about your system configuration, compares it with a set of rules in its built-in knowledge base, displays the results on your screen, and lets you print out the report. And you can perform over 150 comprehensive hardware diagnostics with Peace of Mind. It provides a complete diagnostic test suite and a real hardware workout. Peace of Mind is ideal for testing your RAM, SCSI bus & disks, video processors, modem, mouse, floppy drive, clock, ROM, graphics cards, and more.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5, a hard drive.

Teknosys/Polybus Systems Corporation

6557/6558 Help! & Peace of Mind Bundle

NEW!

$449.

TVator Pro

Turn any Mac or PC into a powerful multimedia presentation system. The TVator Pro is a small, lightweight, portable device that converts analog RGB/VGA to NTSC signals for flicker-free color output on big screen TV, RGB video, LCD projectors, and RGB/SVGA monitors. Includes cables, power adapter, utility disk, TV brightness controller, and user's manual.

Minimum requirements: LC II; LC III; IIvx; IIvi; Centris 610, 650; Quadra 700, 800, 900, 950; PowerBook 160, 165c, 180, 180c; TV with Composite Video or S-Video Input.

Antec

6903 TVator Pro

$31.

Shanghai II, The Dragon's Eye

Snap off matching pairs 'til you run out of tiles, run out of moves, or run out of time in Shanghai. And this version of the captivating strategy game gets even better. Dragon's Eye is a special challenge for superior Shanghai players. It's move against move, as one player seeks to complete the Dragon formation, the other to dismantle it. Play the computer or a friend.

Minimum Requirements: Mac Plus, 1MB RAM, System 6.0.5.

Activision

4342 Shanghai II, The Dragon's Eye

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$34.

Star Trek: 25th Anniversary

Beam aboard the U.S.S. Enterprise and continue a quarter century of exploration. Star Trek: 25th Anniversary combines a realistic, 3D space-flight simulator with role-playing adventure. As James T. Kirk, you control phasers, photon torpedoes, shields, communications, and warp drives. Pilot the Enterprise through stunning, state-of-the-art, digitized model graphics. Come face-to-face with dozens of alien races. Scan and survey hundreds of fractally-generated worlds. Beam down with your landing party and interact with aliens and artifacts. Relive the historic TV show with the complete musical score featuring digitized sound effects from the series.

Minimum requirements: Any color Mac, 1.5MB RAM, System 6.0.7.

MacPlay

6847 Star Trek: 25th Anniversary

MACPLAY

NEW!

$34.

Axis The Gamecheater

It's a win-win situation with The Gamecheater, the world's first game utility. Your weaponry is superior and you are immortal. Axis The Gamecheater lets you override predefined game functions with assignable hot keys. Add time, lives, money, extra ammo or fuel, and jump to different play levels in your favorite games – whatever it takes to win.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.7.

Baseline

6896 Axis The Gamecheater ○

NEW!

$37.

Pathways into Darkness

Continuous-motion, 3D, texture-mapped graphics have arrived on the Mac! You'll explore an ancient pyramid on your mission to save the world from a hostile alien demon. Explore miles of catacombs through a smooth-scrolling, first-person interface. Beautifully rendered graphics and active panning stereo sound combine to make Pathways Into Darkness the closest thing to virtual reality without a helmet.

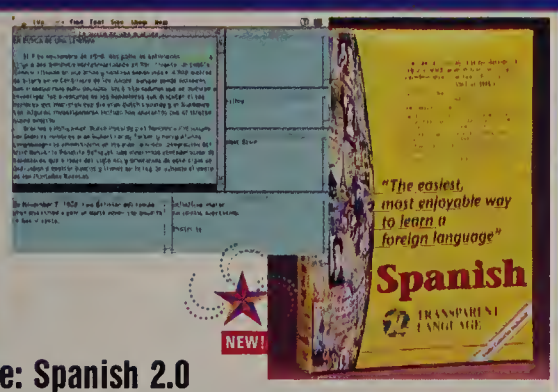
Minimum requirements: Any 256 or 8-bit color Mac, 2MB RAM, System 6.0.5, 5MB hard disk space.

Bungie

6639 Pathways into Darkness

$78.

$10. OFF!



NEW!

Transparent Language: Spanish 2.0

Learn a language by reading interesting literature. It's true. You'll learn by reading and understanding rather than by drill and memorization. "Does it work? Yes," writes Associated Press. Just place your cursor on any text you don't understand and instantly see the meaning, grammar, and more. You read real literature that grabs and holds your attention, all in the original Spanish. You also hear the stories on the included audio cassettes. Play the fabulous VOCABULOUS! to strengthen your vocabulary. Also new to version 2.0 are word review lists. Includes Transparent Language software, three stories in Spanish, a sample story in each additional language, and audio cassettes. Also available in French, German, Italian, or Latin.

Minimum Requirements: Mac 512K, System 6.0.

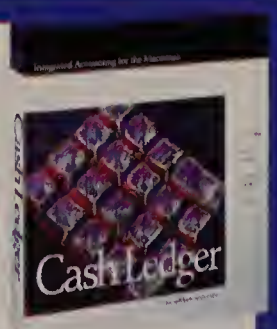
Transparent Language

4864 Spanish 2.0

TRANSPARENT LANGUAGE®

$78.

New Price!



Cash Ledger 2.0

This easy-to-use cash-based accounting program for managing personal and small business finance lets you record checks and deposits, reconcile bank accounts, keep track of vendors, create financial reports, and more. Pop-up lists make data entry fast and simple. Create recurring entries to save you from redundant typing. Each time you enter a transaction.

Minimum requirements: Any Mac with 1MB RAM, System 4.2, hard disk recommended.

Checkmark

1333 Cash Ledger 2.0 ○

NEW!

$49.

FLOWERscape

Plan your spring garden now with FLOWERscape! View its growth in color, as it would appear in any month of the year. Through its easy-to-use interface, FLOWERscape helps you choose what to grow and where to grow it. Just enter soil, sun, and geographic information, and the program recommends suitable plants. Includes FREE pH test strips.

Minimum requirements: Any Mac with a 256-color monitor and high-density floppy drive, 1.5MB RAM, System 6.0.4, 8.5MB hard disk space.

Voudette

6701 FLOWERscape-Mac (pictured)

6702 FLOWERscape-Windows ..... $49.

$29.

NEW!

The Disney Collection Screen Saver

Delight in the magic of Disney with all your favorite Disney characters in this latest addition to the After Dark family! Enjoy over 15 fantastic sound-packed displays including the *Sorcerer's Apprentice, The Little Mermaid,* and *101 Dalmations.* This stand-alone product is After Dark-compatible and includes screen-locking password protection and System IQ to maximize performance.

Minimum Requirements: Mac Plus, 2MB RAM, System 6.0.4.

Berkeley Systems

6819 The Disney Collection

NEW!

$34.

Mangia!

Draft your Mac into KP duty. Mangia! includes hundreds of recipes and you can add your own. Find recipes you can cook with the ingredients on hand. Zero in on recipes for their kid appeal, spiciness, and more. Choose a recipe, then easily adjust the ingredients for the number of servings you need. Plan a menu for a week, and Mangia! writes the shopping list for you.

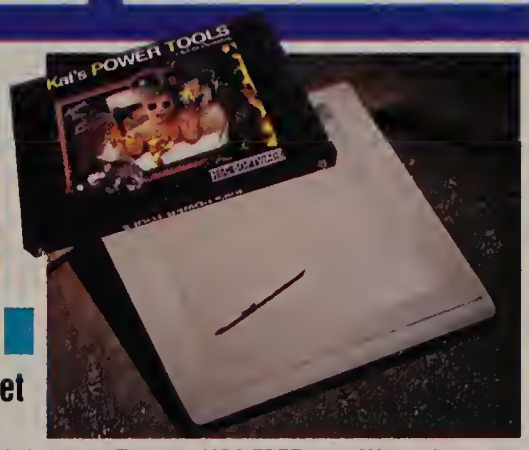
Minimum requirements: Any Mac with 1MB RAM, System 6.0.5.

Upstill Software

6901 Mangia!

NEW!

$518.



Wacom 12" x 12" Tablet & Kai's Power Tools

Get the fabulous filter effects of Kai's Power Tools by HSC FREE with Wacom's new 12" x 12" tablet. This serial tablet has a square foot of working area, enough for serious computer artists to create masterpieces on their Macs. Wacom is the technology leader in graphics tablets and cordless, batteryless, pressure-sensitive pens. The 12" x 12" tablet offers you the most precise, delicate, real-time control possible over your graphic input – 120 levels of pressure. A menu strip adds flexibility by allowing you to define functions and macros. And this tablet includes a transparent protective overlay and enhanced control panel features.

Minimum requirements: Mac Plus.

Wacom

6898 12" x 12" UD-1212R Tablet with Stylus & Kai's Power Tools ○

WACOM

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$138. Smart Label Printer Plus

Smart Label Printer Plus

The Smart Label Printer Plus is a powerful enhancement to your computer – one capable of handling dozens of everyday tasks, saving you considerable time over setting up, formatting, and printing envelopes or labels on your regular printer. Create labels for envelopes, folders, Rolodex cards, and more. No more hand- or type-written envelopes. Print personalized labels or mailing lists from your applications. Use it right at your desk. The integrated software works as a desk accessory with WYSIWYG screens and background printing. Everything you need is included – label printer, software, power supply, printer cable, and a roll of labels.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.3.

$238. Smart Label Printer Pro

Smart Label Printer Pro

Produce fast, high-resolution, laser-quality output on multiple label sizes. The Smart Label Printer Pro prints at twice the resolution of other label printers. Using Seiko Instruments' latest and most advanced thermal print engine, the Pro can print text, POSTNET, bar codes, even photo-like graphics from digital images. Print labels for envelopes, file folders, ID badges, diskettes, binders, and more. The Smart Label Printer Pro comes complete and ready-to-use with printer, software, printer cable, power supply, and a roll of labels. Complete set-up takes only minutes. It's quick and quiet, printing labels in as little as six seconds. No ribbon, ink, or toner is required.

Minimum requirements: Mac Plus.

Part #	Description	Size	Price
For the SLP Pro and Plus Models			
6520	White Labels (2 rolls/box) 130 labels/roll	1 1/8 x 3 1/2	$8.
6911	Clear Labels (2 rolls/box) 130 labels/roll	1 1/8 x 3 1/2	$12.
For the SLP Pro only			
6912	White Labels (2 rolls/box) 260 labels/roll	1 1/8 x 3 1/2	$12.
6913	Shipping Labels (1 roll/pk) 320 labels/roll	2 1/8 x 4	$12.
6914	Disk Labels for 3.5" disks (1 roll/pk) 320 labels/roll	2 1/8 x 2 3/2	$14.

Seiko Instruments

6154 Smart Label Printer Pro ○

5676 Smart Label Printer Plus ○

Color labels available! Ask your sales person.

SII Seiko Instruments

$374. Mac DisplayLink w/Action

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Get Action FREE with purchase of the Mac DisplayLink.

Mac DisplayLink w/Action

Beat the high cost of data display with an external computer link to video from Display Tech. When it comes to conventional monitors, VCRs, even video projectors, nothing works like Display Tech's "flicker-free" link to video. Just plug and play. You don't need any additional software. And it won't slow down graphics. Display any software package in real-time. Supports composite, S-Video, and 256 "flicker-free" colors.

Minimum requirements: Mac DisplayLink— Mac II with Apple B.24 or compatible video card. CVLink— LC, Performa, Centris, IIvx, Quadra, PowerBook.

Display Tech, Inc.

6875 Mac DisplayLink w/Action

6877 CVLink scan converter w/Action ..... $559.

$158. Lapis SCSI Dock

POWERBOOK RECOMMENDED

NEW!

Lapis SCSI Dock

The Lapis SCSI Dock is the only way to add a SCSI port and an ADB port for under $170. Connect your PowerBook Duo directly to any other Mac and operate in SCSI Disk Mode so that the Duo's hard disk appears on the Finder of the other Mac. You have fast access to information and file transfers. And the SCSI Dock weighs only five ounces, so it's a perfect portable solution. You can also connect your Duo to any SCSI device like a CD-ROM drive, second hard drive, or scanner. And the ADB port allows you to hook up a desktop mouse, trackball, keyboard, or tablet. Add flexibility to your Duo the affordable way.

Minimum requirements: PowerBook Duo 210 or 230.

Lapis

6849 Lapis SCSI Dock ○

How to Order

- Call 1-800-815-0009 anywhere in the USA or Canada. Call 206-883-8312 for international orders.
- Fax your order to 1-800-881-3090. International fax orders: 206-881-3090.
- For electronic orders, use Compuserve (76635,660), GEnie (MACSPLACE), or America Online (MacsPlace).
- Mac's Place is open from 6 a.m. to 10 p.m. M-F Pacific Time, and 7 a.m. to 6 p.m. on Sat., and 8 a.m. to 5 p.m. on Sun.
- No sales tax (except WA residents add 8.2%, OH residents add 6%, to total, including shipping).
- VISA, MasterCard, Discover Card, American Express, OPTIMA, checks, and P.O.s gladly accepted. Your credit card is never charged until your product ships.
- All in-stock items ship same-day, (barring system failure, etc.) to your doorstep, for just $3 (USA) via Airborne Express overnight service. Rural locations may require an additional day for delivery. Areas not serviced by Airborne Express will be sent via Priority Mail.
- Our $3 shipping charge includes insurance at no extra charge.
- When a partial order is shipped, we pay freight on additional shipments.
- Many products carry a money back gurarantee (MBG).
- Defective software is replaced immediately with like items. Defective hardware items repaired or replaced at our discretion.
- We reserve the right to revoke money back guarantee privileges.

International Orders

- Call 206-883-8312 for our international sales line.
- Fax your order to 206-881-3090 for international orders.
- We ship throughout the free world.
- International orders will be charged full shipping rates plus insurance.

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$278.

NEW!

Perfect for the Powerbook!

ScreenLink Twin-Pak & SupraFAXModem 144PB

This is the perfect bundle for the telecommuter. With the ScreenLink Twin-PAK you can easily access your office Mac from home, and your home Mac from the office. Just dial in using your modem, and you've got complete control of your Mac. Use ScreenLink to check your e-mail, get an important file, or perform any other work on your remote Mac. The 144PB gives you 14,400 bps fax and data communications on a card that fits inside your PowerBook. Wake Up mode turns you PowerBook on when the modem receives a call and, when combined with the included fax software, can send scheduled faxes when rates are lowest.

Minimum requirements: Mac Plus, PB 100, 1MB RAM, System 7, 1.44MB floppy or hard drive.

Datawatch/Supra

6899/5575 ScreenLink & SupraFAXModem 144PB Bundle

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Macintosh

Mac Centris 610 4MB RAM/80MB HD 610 with 14" color display & keyboard **$1,999**

Displays & Cards

Sigma Designs 14" Trinitron Multi-resolution Trinitron display. 25mm dot pitch.

MW Editor's Choice May '93

21" SilverView Pro (mono/GS)	1099
15" Color Max Display	599

E-MACHINES

E-Machines T16 II/T20 XL	1249/2579
E-Machines Futura SX 24-bit card	399
E-Machines NEW Ultura LX	Call

Scanners

UMAX 840 800dpi Color Scanner with full PhotoShop	1299
UMAX 1260 1200dpi Color Scanner with full PhotoShop	Call

Mac Systems

Mac LCIII Color System $2,549
4 MB RAM/80HD, 14" Sony Color Trinitron Display, Apple Keyboard, System 7 & GCC PLPII Laser Printer.

Mac Centris 650 Color System $4,399
8 MB RAM/230HD, w/Ethernet, FPU, 16" Trinitron Display, 24-bit color card, Apple ext. Keyboard & System 7.
Add GCC BLPII, 8ppm Laser Printer for only $1,039.

Printers

PLPII, 300 dpi, w/free ATM	629
NEW Eclipse8, 8ppm, w/Ethernet	1599
BLP IIS 300dpi, 8ppm, 35 fonts	1039
SelectPress 600, 11x17, 600 dpi	4149

Kai's Power Tools powerful & easy to use.

The Ultimate Plug-in filters for Adobe Photoshop

Macs

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Get 24-bit color on screens up to 16" or 8 •16-bit on screens up to 21"

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ProServer 24 24-bit Nubus card	439
SCSI Dock all ports for Duos	299
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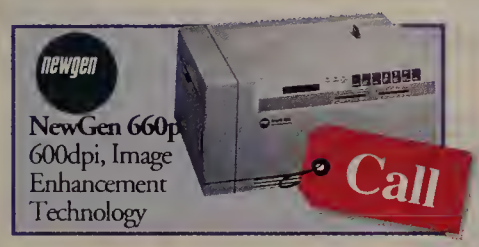

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with Kai's Power Tools Software

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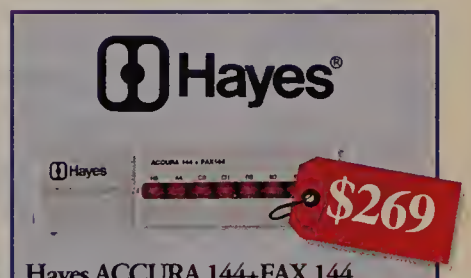
Modems



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Hayes ACCURA 24 74

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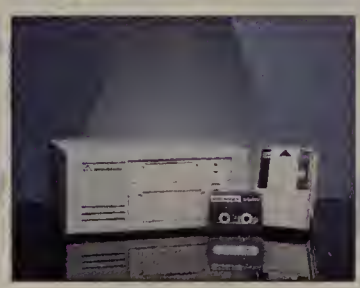

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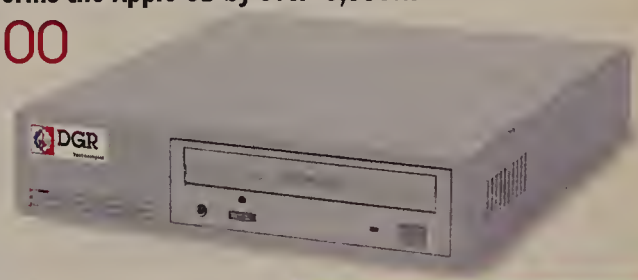

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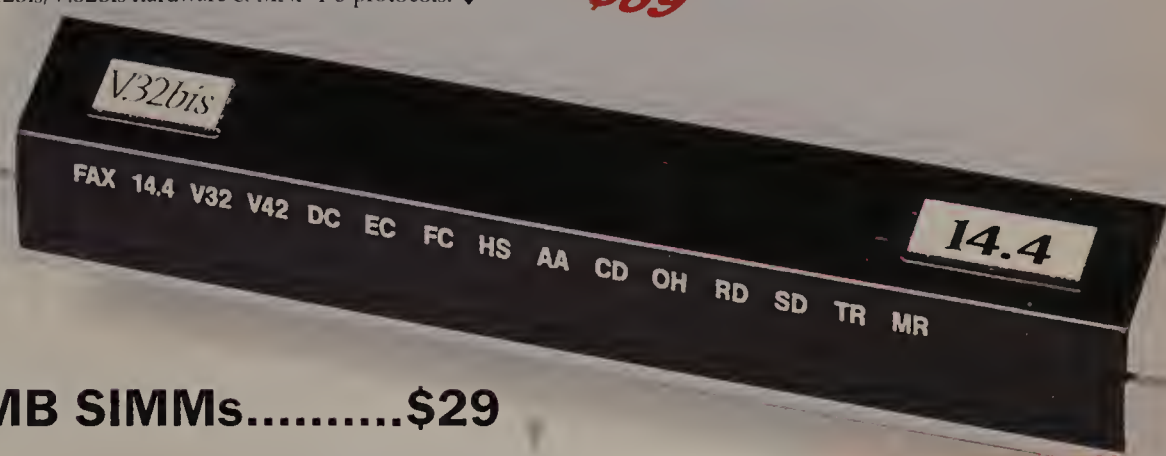

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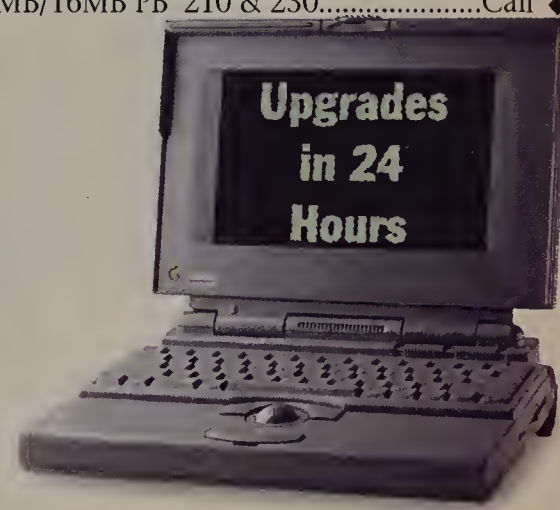

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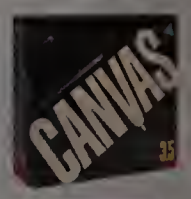

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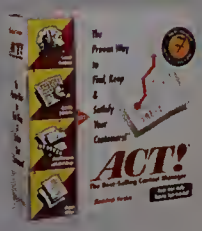

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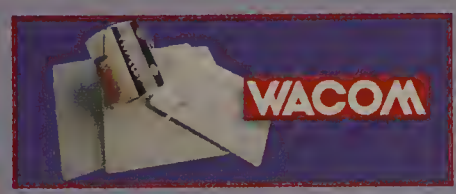

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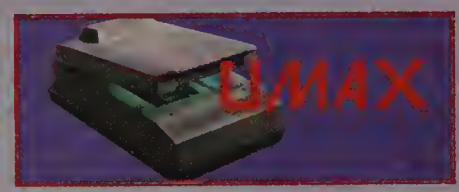
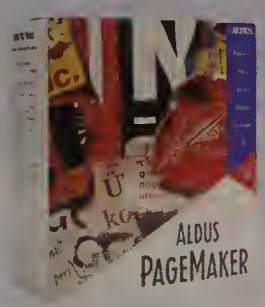
MicroLaser PS17 w/Appletalk	$805.95
MicroLaser PS35 w/Appletalk	$850.95
MicroLaser Turbo w/Appletalk	$1,108.95
1mb Mem Upgrade	$40.95
4mb Turbo Upgrade	$250.95
MicroLaser Pro 600 PS23	$1,389.95
MicroLaser Pro 600 PS65	$1,575.95



630LE flatbed	$870.95
840 flatbed	$1,265.95
1260 Flatbed	$1,869.95
1200 Flatbed	$2,699.95
630LE & Transparency	$1,539.95
1260 & Transparency	$2,525.95
Transparency Adapter	$689.95
Auto Document Feeder	$425.95
Scan Office	$829.95

Fractal Design

Painter	249.95
W/ Wacom Tablet	200.95
Sketcher	$89.95
X2	$69.95



Aldus
PageMaker 5.0
$579.95
PTS Training Tape
$48.95

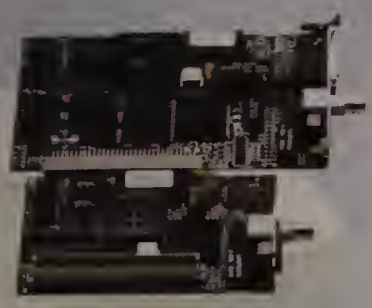
QMS
Colorscript 1000
$11,499.95

E-Machines

T-16 II Display	$1199.95
Futura IISX Card	$429.95
Futura IILX	$775.95

Digital Equipment Corp.
DECLaser 1152
$849.00

Pioneer
6 Disk CD-ROM
$1399.00



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1.2GB	M2266SA	5.25 FH	14.5	$1199	$1299
2.0GB	M2652SA	5.25 FH	14.5	$1989	$2089
2.4GB	M2654SA	5.25 FH	14.5	$1849	$1949
• Warranty/five years					
QUANTUM					
42MB	ELS42	3.5 1"	19	$114	$165
85MB	ELS85	3.5 1"	17	$174	$224
127MB	ELS127	3.5 1"	17	$189	$239
170MB	ELS170	3.5 1"	17	$195	$245
240MB	LPS240	3.5 1"	10	$259	$323
525MB	LPS525	3.5 1"	10	$627	$689
700MB	PRO700	3.5 HH	10	$794	$849
1.0GB	PRO1050	3.5 HH	10	$926	$999
1.2GB	PRO1225	3.5 HH	10	$1029	$1099
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120MB	Go•Drive	2.5 19MM	17	$275**	$375
160MB	GRS	2.5 19MM	17	$289**	$389
• Warranty/two years, ELS, LPS • Five years PRO • one year 2.5"					

		Single	Dual
SYQUEST			
44MB	IMS 44MB External	$359	$665
88MB	IMS 88C External	$519	$999
105MB	IMS 105MB External	$649	
44MB	44MB Cartridge		$61
88MB	88MB Cartridge		$94
• SyQuest drives ship with one cartridge			
• Warranty/two years, drives • One year cartridges			

SEAGATE					
2.0GB	ST11950N	3.5 HH	8	$1689	$1749
2.5GB	ST12550N	3.5 HH	8	$2346	$2309
2.4GB	ST42400N	5.25 FH	11	$1850	$1950
3.4GB	ST43400N	5.25 FH	11	$2299	$2399
• Warranty/five years					
TOSHIBA					
213MB	MK224FB-S	2.5 19MM	12	$559**	$659
• Warranty/one year					
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Umax scanners - bundled with Adobe PhotoShop.

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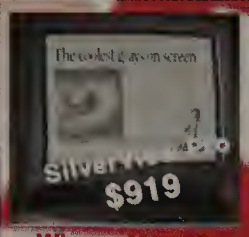
The first desktop motion video camera and stereo microphone for multimedia applications. NTSC/PAL/S-Video compatible. For Mac and Windows applications.

FlexCam $599

SIGMA DESIGNS



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MacWorld Editors Choice Winners

Winner May 93

SilverView Pro Grayscale Flat 21" screen provides 16" x 12" of active display area at 72 dpi resolution (1152 x 870). Works with Quadra, NuBus and SE/30 computers.

$1069

Winner October 93

Ergo-View 17 True full screen WYSIWYG display. Supports up to 1280 x 1024 at 120Hz. Trinitron tube compatible with Apple & PC environments.

PageView GS*	15" Grayscale	$499
SilverView Portrait*	21" Grayscale	$1079

* Controller cards and anti-glare available for additional cost.

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"Super performance for ALL software applications! Accelerates everything your computer does. From Quickdraw screen refreshes to spell-checking your documents, the PowerCache turbocharges your computer transparently."
Classic, Color Classic, SE, SE/30, LC, LC II, LC III, II, IIx, IIcx, IIci, IIsi, IIvi IIvx, Performa 400 and 600 - *adapter required for all but the IIci, IIsi, IIvi and Performa 600.*

PowerCache '030 Series		w/FPU
33MHz	$345	$431
40MHz	$513	$602
50MHz	$625	$735
PowerCache Adapter		$99

Turbo '040 Series - *II IIx, IIcx, IIci, SE/30, IIsi, IIvx, IIvi & Performa 600*	
25MHz	$937
33Mhz	$1106
40MHz	$1599

FastCache Series - *static RAM cache card*	
& Turbo (128k)	$169
Quadra 700/900	$235
Quadra 800/950	$335
IIsi (64k)	$284
IIsi (64k) w/FPU	$349
IIci (64k)	$205

Turbo '040 Series - II IIx, IIcx, IIci, SE/30

25MHz	$675
33MHz	$785
33MHz	$861
FastCache Turbo	$199

APPLIED ENGINEERING

Add an FPU, Ethernet or expanded video card. Backed by a three year warranty.

TransWarp '030 Series		w/FPU
for Mac LC, LCII, Performa 400, & Color Classic		
4340 40MHz	$379	$505
for Mac SE		
1325 25MHz	$199	
1340 40MHz	$313	$454
for Mac Classic		
1325 25MHz	$199	
2340 40MHz	$313	$454

TransWarp '040 Series		
6425f	25MHz	$899
6433f	33MHz	$1100

- Includes built-in FPU
- Fully compatible with all standard '040 compatible software

• Increased performance available by including 128k cache option - *for only $109!*

EXTERNAL DRIVE ENCLOSURES

• Premium Housing	$99
• Standard Housing	$89
• Full Height Housing	$145
• Mini Housing	$99

- Premium Housing - half height - open or closed front bezel - dual AC outlets.
- Standard Housing - half height - open or closed front bezel.
- Full Height Housing - holds one full height or two half height drives - removable front bezel design.
- Mini Housing - holds one 2.5" drive - includes 120V wall adapter (optional 220V adapter available).

WACOM ARTZ

ArtZ plugs directly into your Mac's ADB port. Includes cordless stylus. No batteries needed.

6" x 8" ArtZ Tablet	$309
6" x 9"	$462
12" x 12"	$660
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BHC S02-1101 **Wetsuit** **$39.90**

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BHC T04-3110 **Language Tutor** **$49.90**

I Like Icon!

Make your icons do backflips with QuickTime movie-icons, and even scan in images that can become your icons. It's the dawning of a new artform: Icon

Art. I Like Icon provides you with a huge library of icons and full-motion "mini-movies" that you can use as is, or customize! It includes drawing and painting tools and even QuickTime.

BHC B05-1114 **I Like Icon** **$33.90**

Thunder 7

Thunder 7 is the single-source reference program for any writing assignment. Its premier spelling and word thesaurus utilities are compatible with any Mac application or Desk Accessory. Correct Your Spelling INTERACTIVELY as you type, or spell-check entire articles all at one time. Check punctuation and capitalization, create your own custom dictionary and more.

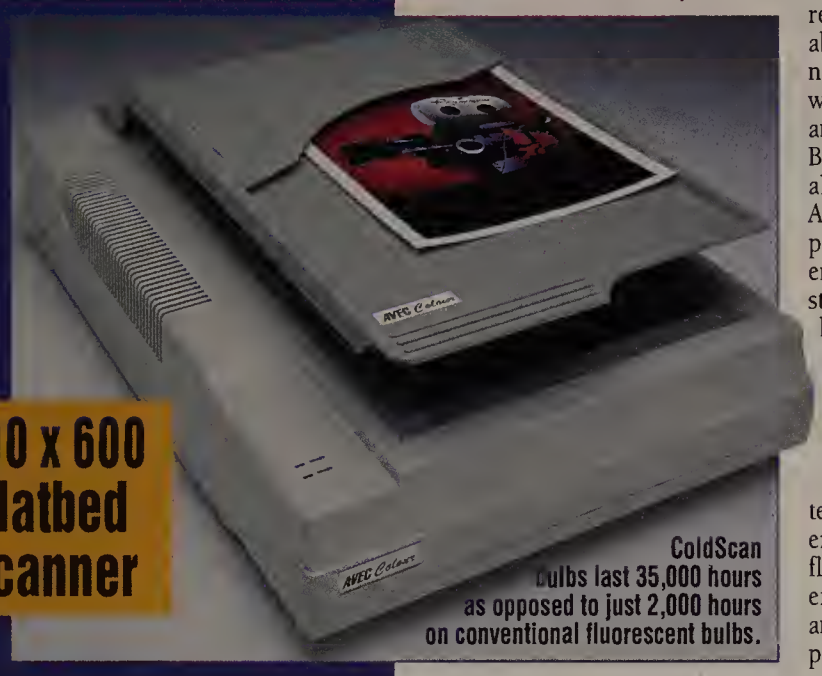
BHC B05-1111 **Thunder 7** **$54.90**

Spectator

Spectator is the easy-to-use screen recording utility that lets you edit audio and video right on your screen. Produce great training materials, software demos and presentations. Record every move you make, what menus and tools to use and how to operate them for maximum productivity. Add titles, video clips, audio tracks and animated sequences to your movies.

BHC B05-1112 **Spectator** **$84.90**

THE AVEC COLOUR 2400



Here's a high-quality flatbed scanner that delivers beautiful 300 x 600 dpi scans – and with software interpolation your scans sizzle with crisp 2400 x 2400 resolution. This remarkable scanner also features new ColdScan technology, which increases bulb life and pumps out hot color! But that's not all... you also get a full version of Adobe PhotoShop 2.5 – plus Wordscan 1.1. The entire desktop scanning studio is yours for the low, low price of just $999.

What are the advantages of ColdScan technology and why is it so important?

A word about ColdScan technology and dust. Other scanners that use hot flourescent lights require exposed optical systems and fans for cooling purposes. The ColdScan's cold lamp light source enables the scanner's optical system to be completely encapsulated, so NO DUST or outside particles can get in. The ColdScan system is more reliable – and virtually silent. And as an added bonus, The Avec Colour scanner needs no warmup time, so it's ready to scan the instant it is turned on. In addition, the scanner lamp stays on only when in use and turns off automatically.

FREE SOFTWARE!
Includes Photoshop 2.5 and Wordscan 1.1

An amazing price on one heck of a scanner! The new ColdScan bulbs deliver dazzling color – dust free – and longer bulb life. And since the Avec Colour dosen't have fans whirring in the background, you get razor-sharp scans. Plus, the Avec Colour provides optimal spectral characteristics which allow for a wide range of overlap on red, green and blue light – resulting in pinpoint-precise accuracy.

We guarantee that you'll love this Avec Colour color scanner, with full-blown 2400 x 2400 dpi color scans. And remember, you get a free (full version) copy of Photoshop 2.5 and Wordscan 1.1. This is a rare opportunity for just $999.

AVEC

BHC R08-2000 **Colour 2400 Flatbed Scanner** **$999.90**
Includes Free Photoshop 2.5 and Wordscan 1.1.

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PUBLISHER'S NOTE: *Based on the proven concept of "Flicker Stimulation" which uses sounds, light and other effects to produce responses in the brain, the SuperMind™ is a powerful system that can actually increase memory, creativity and IQ. Since dominant brainwave activity can affect a person's state of consciousness, the SuperMind can relax the mind-producing Alpha/Theta patterns (brainwaves in the 4 to 10Hz range) associated with deep mental imagery.*

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Culling years of scientific research on the mysteries of the brain, the SuperMind can actually improve IQ, speed learning, increase creativity and imagination, eliminate fear, anxiety and stress, enhance athletic ability and help you think and conceive with great clarity.

How The SuperMind Works. Not only does the brain generate electrical signals on its own, it can also be made to generate specific brainwave patterns through a process known as brainwave entrainment. By using the state-of-the-art micro-processor technology and a special combination of pulsing light and synthesized sound frequencies, your SuperMind recreates this process.

FREE! Bonus Pack. The SuperMind package contains everything – just add your cassette player! There's over $100 in Moodscapes tapes: Thunderstorm, Seashore, Spring Day and Savanna Night. Plus, you get a set of four accelerated language learning tapes – French, Italian, German and Spanish.

But that's not all. You get a $220, 11-cassette motivational series, with a section on attracting prosperity, building self-confidence, weight control and more. Plus, three incredible Mind Journey tapes valued at $75. Wait until you see how well these tapes work!

ZYGON INTERNATIONAL

BHC Z02-1000 **SuperMind** with FREE Bonus Pack **$299.90**

Make Your Mac Faster Than A Quadra!

It's the easiest, fastest and most economical way to get a hot new Mac - without buying a hot new Mac. The Speedster '040 accelerator instantly gives you Quadra performance while letting you keep your investment in your current Mac. The 40 MHz version actually outperforms the Quadra 950! And with prices like these, everyone can afford to do it.

The Motorola '040 processor is the new standard for Mac performance. From the SE/30 on up, including the LC, Performa and II series, you can now have the power of a top-of-the-line Quadra for less than one third of the price!

MACWORLD MW EDITORS' CHOICE
Mobius 030 Accelerator

How fast is fast? You'll notice the difference right away, even in 24-bit color mode. You'll see instant screen redraws in PageMaker, Freehand and QuarkXpress, super fast previews with Illustrator, speedy recalcs in 1-2-3 and Excel, and blazing special effects with PhotoShop. Best of all, the 10-minute installation is easy, works with all Quadra-compatible software, and has the widest selection of speeds and options that offer compatibility with all of today's demanding applications. The Speedster offers the most cost-effective, compatible upgrade path for today's performance-craving applications. Color graphics and publishing, spreadsheets and databases – they all need the power of a Quadra processor.

The Speedster is based on a second-generation PDS (Processor Direct Slot) design that offers greater compatibility than the competition that uses NuBus designs. The simplicity of the PDS design eliminates the need to add expensive memory onto the accelerator. Just slip it in and watch as new fire-breathing life takes your Mac to blistering levels of performance.

MOBIUS

SPEEDSTER 040 ACCELERATORS

BHC M11-2100A	**Speedster 040 25MHz**	$649.90
BHC M11-2100B	**Speedster 040 33MHz**	$849.90
BHC M11-2100C	**Speedster 040 25MHz with FPU**	$849.90
BHC M11-2100D	**Speedster 040 33MHz with FPU**	$1149.90
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BHC M11-2100F	**Speedster 040 LC 25MHz**	$649.90
BHC M11-2100G	**Speedster 040 LC 33MHz**	$849.90
BHC M11-2100H	**Speedster 040 LC 25MHz with FPU**	$849.90
BHC M11-2100I	**Speedster 040 LC 33MHz with FPU**	$1299.90*
BHC M11-2100J	**Speedster 128K Static Cache**	$189.90

SPEEDSTER 040 ADAPTERS

BHC M11-2200A	**Speedster Dual Port Adapter for Mac IIsi**	$49.90
BHC M11-2200B	**Speedster Dual Port Adapter for Mac SE/30**	$49.90
BHC M11-2200C	**Speedster Adapter for Mac IIcx**	$49.90
BHC M11-2200C	**Speedster Adapter for Mac IIx**	$49.90
BHC M11-2200C	**Speedster Adapter for Mac II**	$49.90

*Software and installation disks included. No hidden costs. Call for additional configuration information. *Includes Power Supply*

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MW APS Q 170[2] Quantum 170 ELS mechanism	219	289
APS Q 240[2] Quantum LP240 mechanism	279	349
APS MX 245[2] Maxtor 7245 mechanism	259	329

Internal drives for Quadra 800 and Centris 610 available.

Model	Internal	External
345MB - 540MB		
APS MX 345[2] Maxtor 7345 mechanism	$429	$499
APS Q 525[2] Quantum Lps525 mechanism	669	739
APS MX 540[2] Maxtor MXT540 mechanism	849	919

Model	Internal	External
1.2G - 3.0G		
APS Q 1050[5] Quantum 1050 mechanism	$939	$1009
Mac User LABS APS MS 1.2G[5] Micropolis 2210 mechanism	1199	1269
APS Q 1225[5] Quantum 1225S mechanism	1099	1069
APS MX 1240[3] Maxtor MXT1240S mechanism	1249	1319
APS MS 1.7G[5] Micropolis 2217AV mechanism	1449	1519
APS MS 2.4G[5] Micropolis 1924 mechanism	2399	2499
APS MS 3.0G[5] Micropolis 1936 mechanism	2999	3099

1-5 *Denotes length of manufacturer's warranty*

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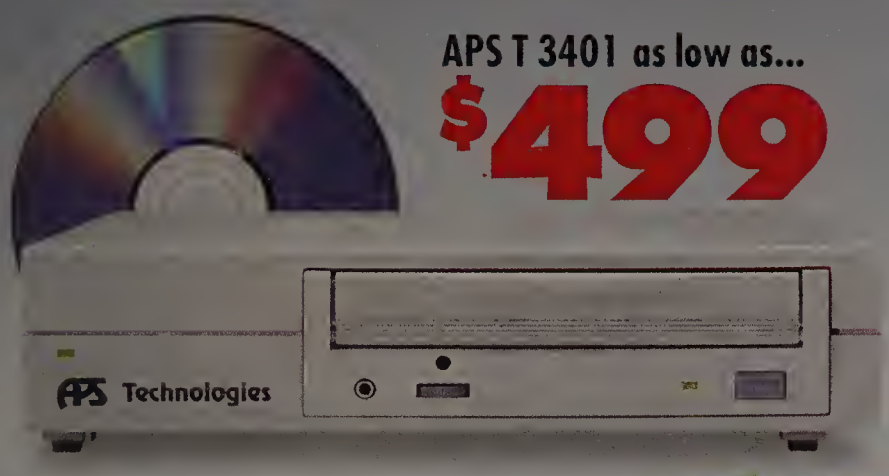

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APS T 3401

The APS T 3401, based on Toshiba's 3401 CD ROM mechanism has an average access time as low as 280 ms and transfer rates as high as 1MB per second! The APS T 3401 is a double-speed unit, fully multi-session photo CD compatible.

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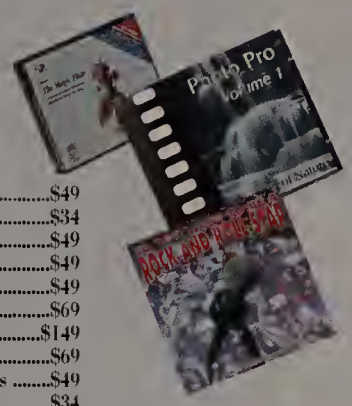
Purchase any four CDs from this list to get the APS T 3401 CD ROM drive for the unbelievable price of $499.



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Ocean in Motion	$149
Presto Studios	$69
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Photo Pro Volume 2/People Doing things	$89
Photo Pro Volume 3	$89
Quick Art Lite	$99
Quick Art Deluxe	$229
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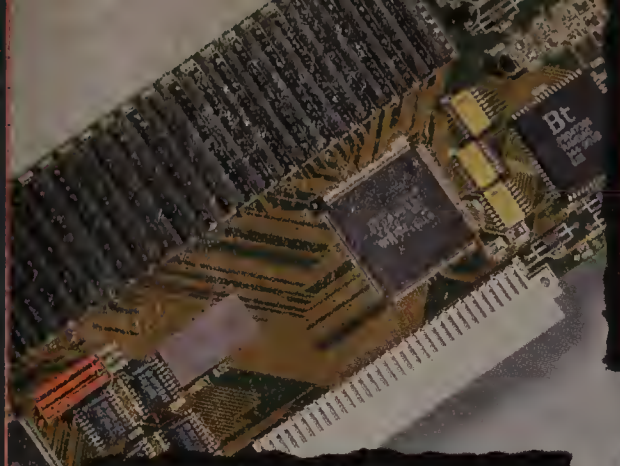

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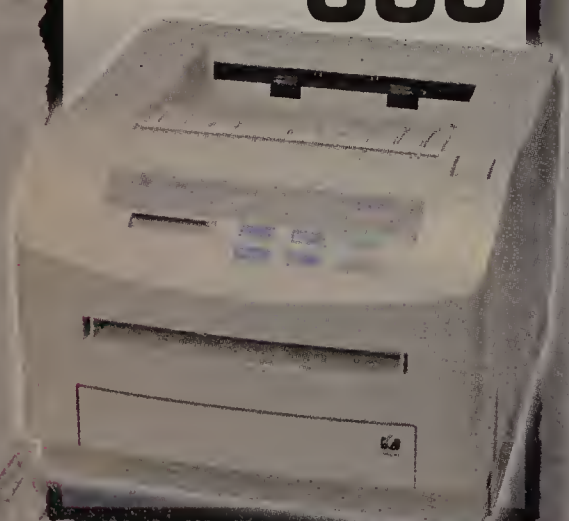

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160MB	2.5" Notebook 17ms	$285	$385
42MB	3.5" LP 19ms	$128	$188
85MB	3.5" LP 17ms	$174	$234
127MB	3.5" LP 17ms	$189	$249
170MB	3.5" LP 17ms	$196	$256
240MB	3.5" LP 10ms	$274	$334
525MB	3.5" LP 10ms	$637	$697
700MB	3.5" HH 10ms	$775	$835
1000MB	3.5" HH 10ms	$937	$997
1200MB	***3.5" HH 10ms***	***$1,087***	***$1,147***

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Capacity	Description	Internal	External
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1200MB	5.25" FH 15ms	$969	$1,069
2100MB	5.25" FH 12.9ms	$1,529	$1,629
2100MB	3.5" HH 8ms	$2,259	$2,229
1600MB	***5.25" FH 11.5ms***	***$1,269***	***$1,369***
2400MB	5.25" FH 11ms	$1,989	$2,089
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Seagate Drives carry a 1 year warranty

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Capacity	Description	Internal	External
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212MB	3.5" LP 15ms	$269	$329
345MB	3.5" HH 15ms	$449	$509
540MB	3.5" HH 8.5ms	$779	$839
1200MB	***3.5" HH 8.5ms***	***$1,279***	***$1,339***
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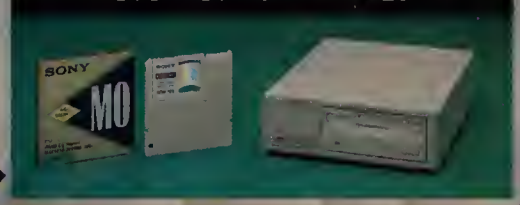

Model	Capacity	Seek	MacKit
Panasonic-128	***128mb***	***35ms***	***$799***
Fujitsu-128	128mb	30ms	$989
Sony-P301	128mb	35ms	$1,269
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Sony-E501	594/650mb	66ms	$1,949
Sony-E502	594/650mb	66ms	$2,049
Ricoh-9200EX	***594/650mb***	***35ms***	***$2,249***
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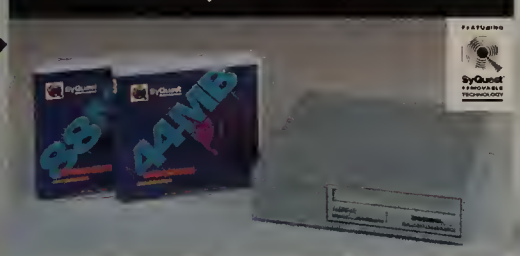

Model	Internal	External
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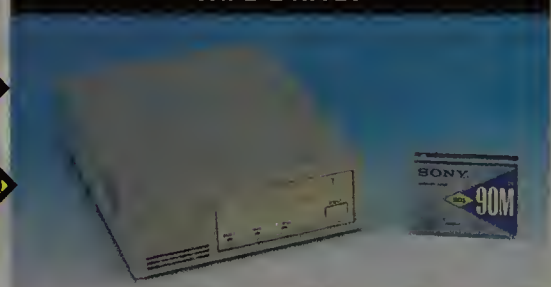

Model	Capacity	Size	MacKit
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Archive Viper 525	500MB	3.5"HH	$699
Sony SDT-2000	2Gbyte	3.5"HH	$1,199
Sony SDT-5000	***5-16Gbyte***	***3.5"HH***	***$1,799***
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HP 35470A	2Gbyte	3.5"HH	$1,189
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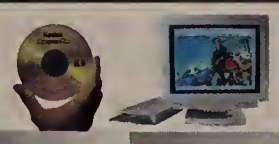

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Model	Description	MacKit
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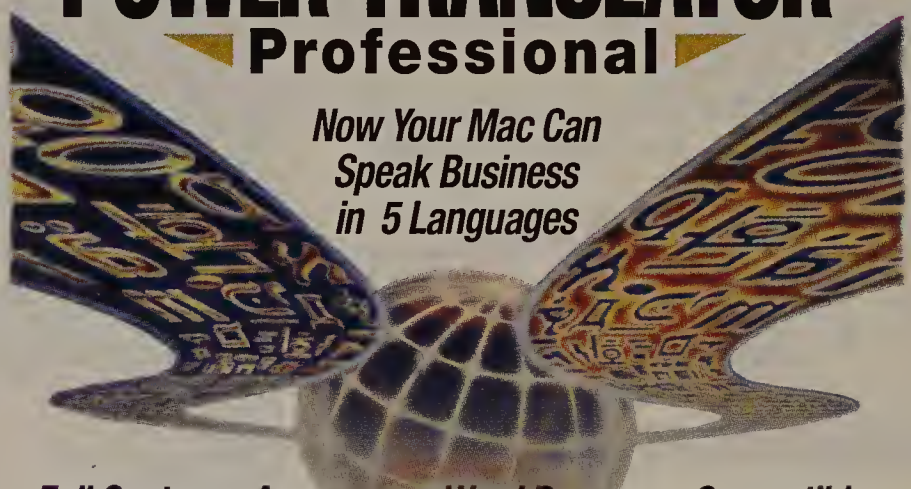

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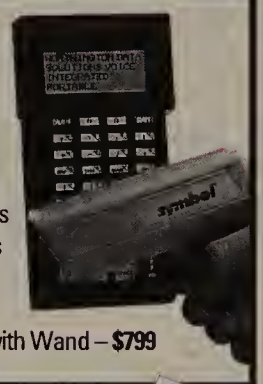

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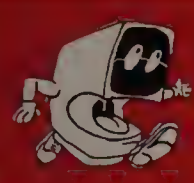

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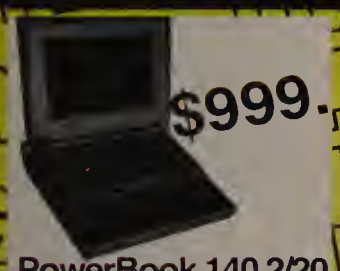

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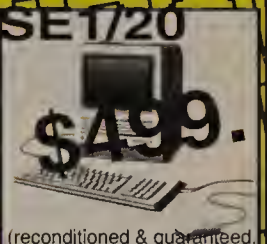

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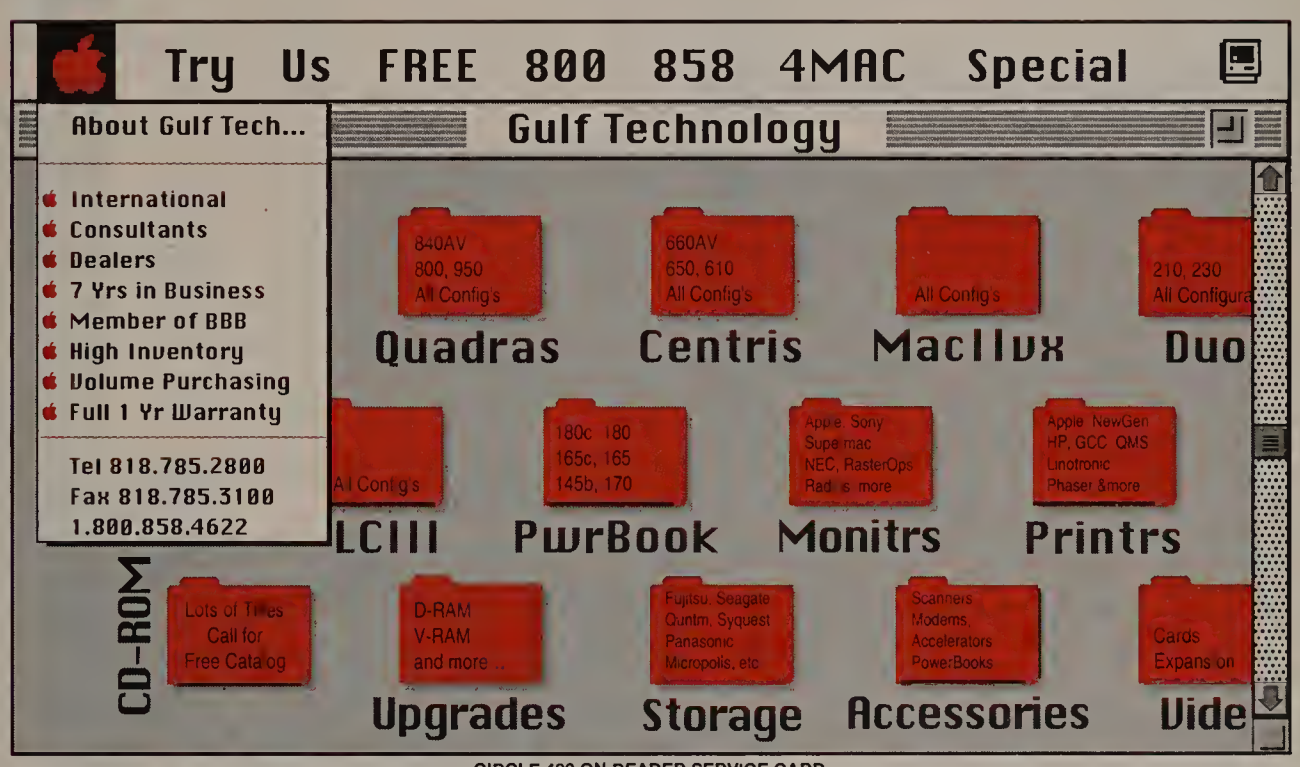

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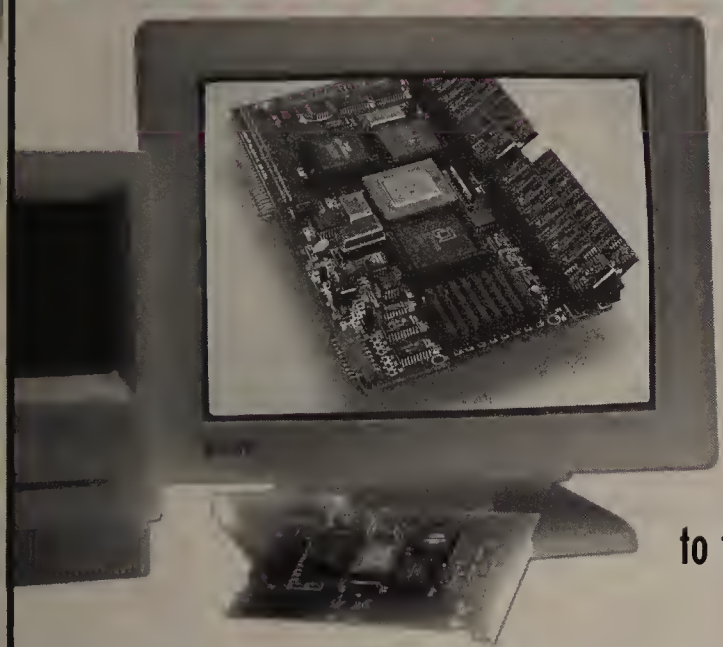

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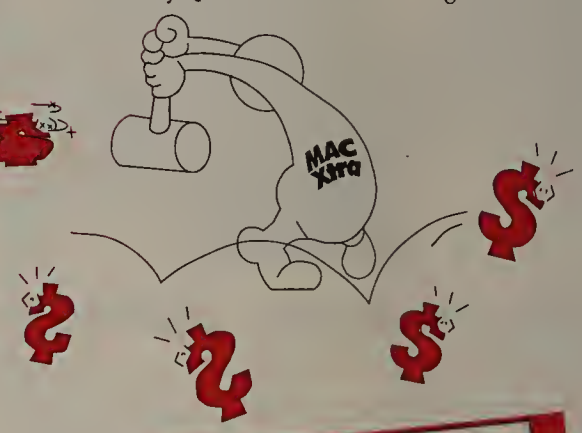

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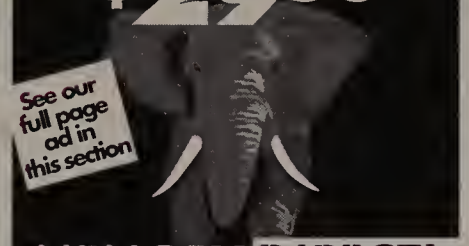

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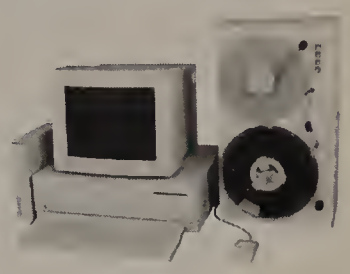

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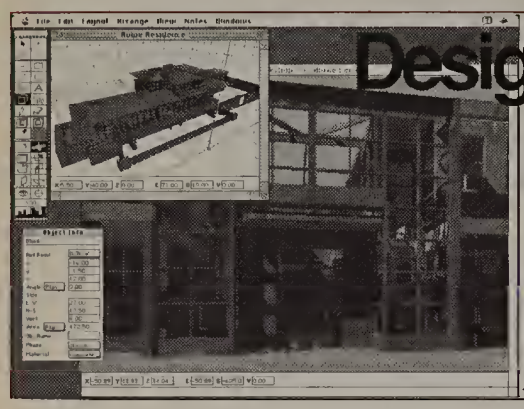

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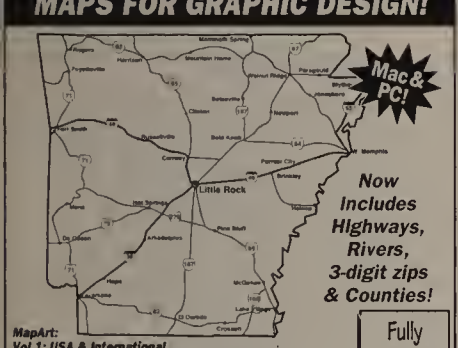

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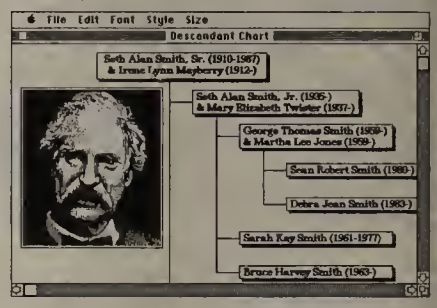

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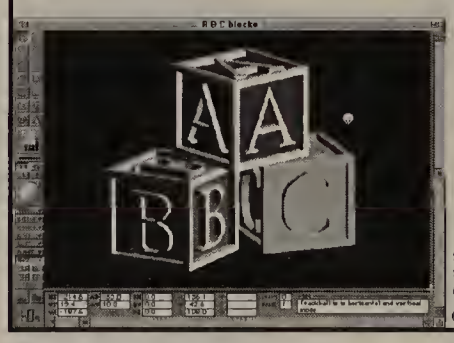

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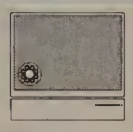

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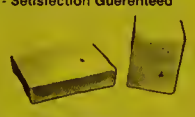

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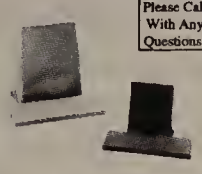

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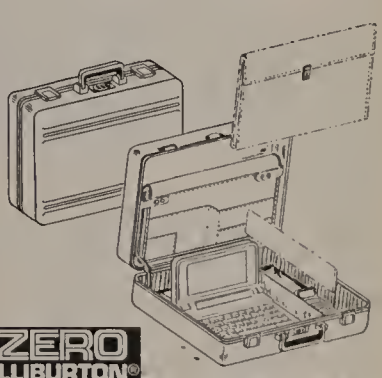

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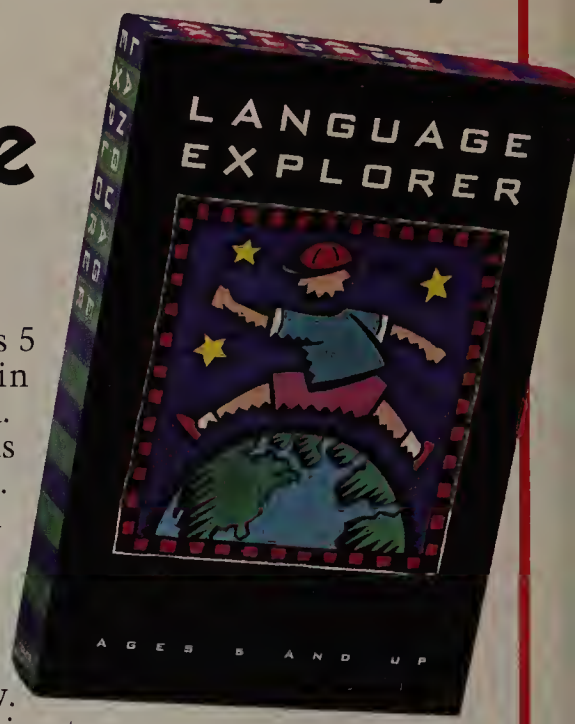

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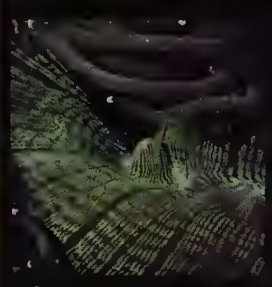

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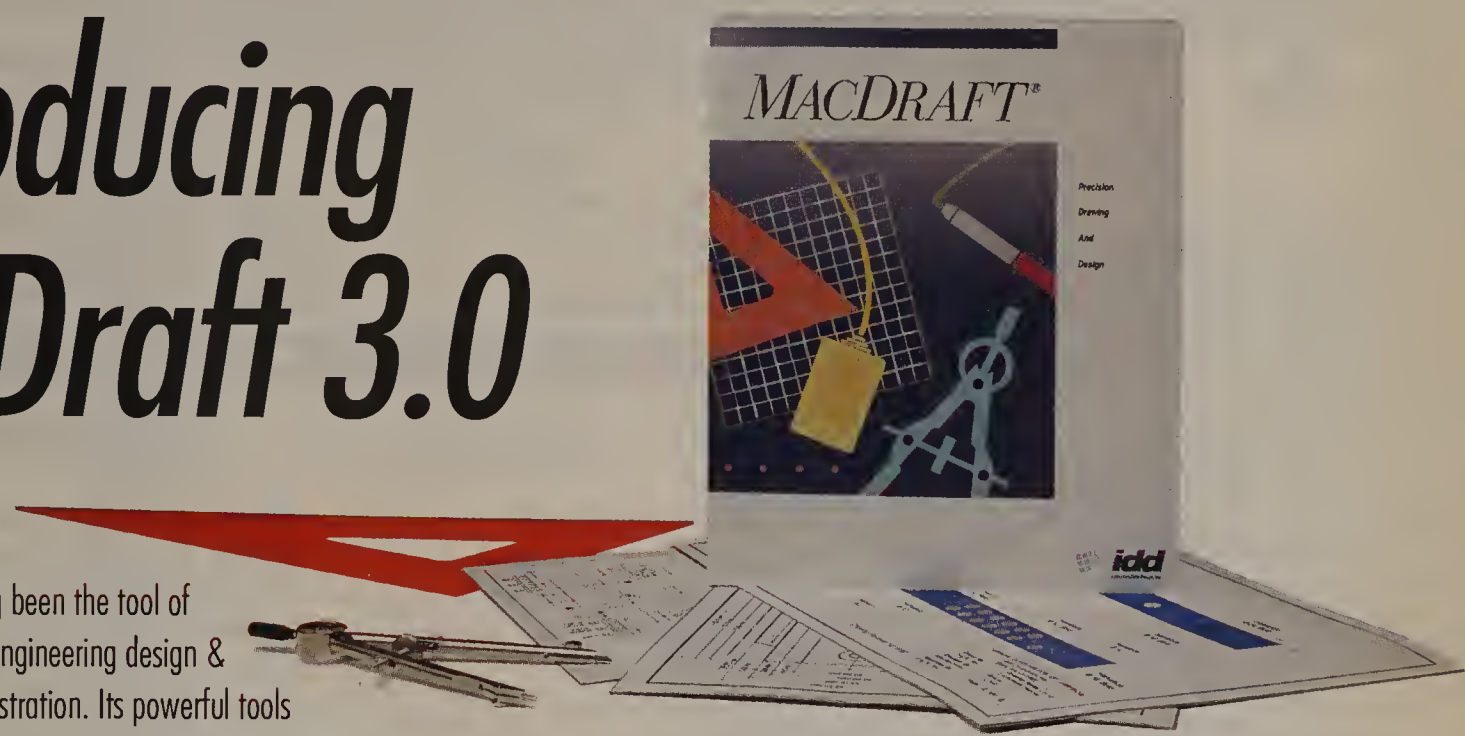

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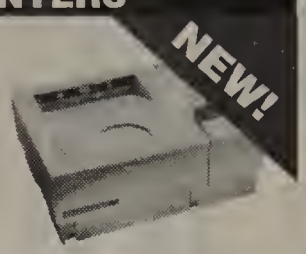

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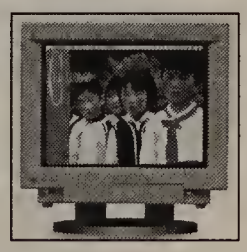

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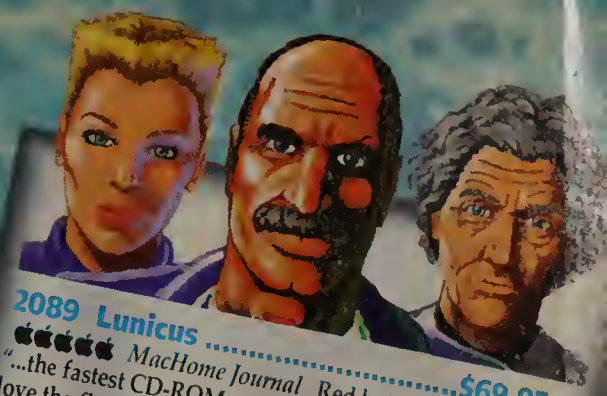

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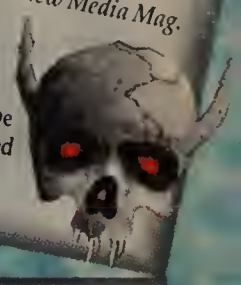

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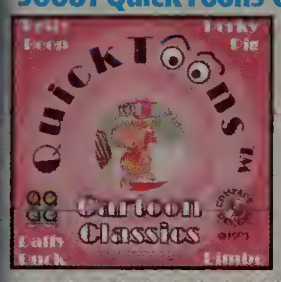

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Rated ♦♦♦♦ *MacUser Magazine*
This interactive exploration is a global geographic voyage so fun and engaging you'll be surprised how much you learn along the way.
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1653 Wraptures One $95
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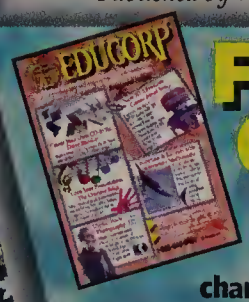

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WISE GUY

BY GUY KAWASAKI

The Macintosh Guide to Fax Etiquette

How to avoid looking stupid when you're trying to look cool

ONCE, IN A MOMENT OF PURE Japanese *mishegoss*,* I decided to print my personal fax number in the books I've written. As a result, over the past four years I've received hundreds of faxes from all over the world, for all sorts of reasons. I consider myself something of a maven on what constitutes a good fax.

This means I have a moral duty to write The Macintosh Guide to Fax Etiquette.

Fax Modem or No

These rules apply especially if you've got a fax modem on your Macintosh. You'd be crazy to buy a nonfax modem for your Macintosh, because fax modems hardly cost any more than plain modems, and you can do a whole lot more (or at least do it more easily) with a fax modem than with a fax. Before you make yourself look like a goy with your newfound fax functionality, though, read on.

Simplify, simplify, simplify. Remove unnecessary graphics, Garfield cartoons, shaded areas, and new-age-design gradient fills. They take a long time to transmit (increasing long-distance charges) and to receive (tying up the recipient's fax machine). They also take more paper to print. Plus, what looks cool on your gray-scale monitor comes out as a blob on your recipient's machine. You think you're funny. Your recipients think you're a joke.

Use very legible typefaces and big font sizes. Delicate typefaces that look as if they were designed by Martha Stewart or Laura Ashley may look good to you, but they're difficult to read in a fax. Also, the smallest font size you should use anywhere on a fax is 12-point.

Keep your faxes short. My fax machine holds 100 sheets of paper and 28 pages in memory. When I'm away for a week, the machine sometimes runs out of paper—especially when someone thinks his or her business plan is so brilliant that I would want to read all 30 pages of it.

No fax should be more than five pages; anything longer should be sent by overnight mail. If I could find a fax machine that confirms the receipt of a whole document but receives only the first five pages, I would buy it in a nanosecond.

Don't send a fax if the recipient can't respond by fax. Sometimes I get faxes sent through copying services because the sender doesn't own a fax machine or fax modem. This immediately puts me in a funk. If I respond via the copying service, can I depend on the Axl-Rose-T-shirt-wearing rebel with an earring through his nose to get the fax to the sender? At least provide your phone number and address so the recipient can send you a letter.

Sometimes I get a fax with a note that asks me to call before sending a fax so that the sender can turn on the fax machine or hook up the computer. When I get these, I'm tempted to set my fax modem to transmit at 3 a.m. so the person wakes up and, after the third call by my fax modem, sleepily comprehends what's going on.

Provide your fax and phone number in the header. Most fax-modem software provides fields for your name and fax number in the header or footer. But I can't tell which number is for fax and which is for voice on many faxes I get. If your software displays a telephone icon to denote the number field, make it crystal clear by entering text such as "Phone: 415/555-1212" and "Fax: 415/555-1213."

Make it easy to respond, especially to overseas faxes. Include the dialing sequence—the country and city codes—to use for the response. For example, many faxes from foreign countries list a 0 in front of the city code. This 0 is extraneous when dialing from the United States.

Test your faxes. After you've taken these steps, send yourself a fax to see what your recipients will see. Is it entirely legible? Is your cover sheet necessary? Do you give the recipient a way to respond? If you want to test your fax etiquette, send me one at 415/921-2479; I'll grade it for you. Be forewarned—I'm ruthless.

Don't Bother

The last rule of fax etiquette is the simplest: don't send faxes at all. Use E-mail instead. E-mail messages don't waste paper, text in them can be copied and pasted, they don't require long-distance calls, and they can be more easily deleted (and—sometimes more important—ignored). m

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GUY KAWASAKI's views are his own and only sporadically represent those of *Macworld*. His latest book is *The Computer Curmudgeon* (Hayden Books, 1992). He has investments in Objective Software, Global Village Communication, Bookmaker Corporation, Bit Juggler, and others. He is currently working on a book titled *Hindsights*, due out in December.

* *Mishegoss* is Yiddish for insanity or madness, as in, "Chaim, you bought a 486 with Windows instead of a Macintosh. That's pure mishegoss!"

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